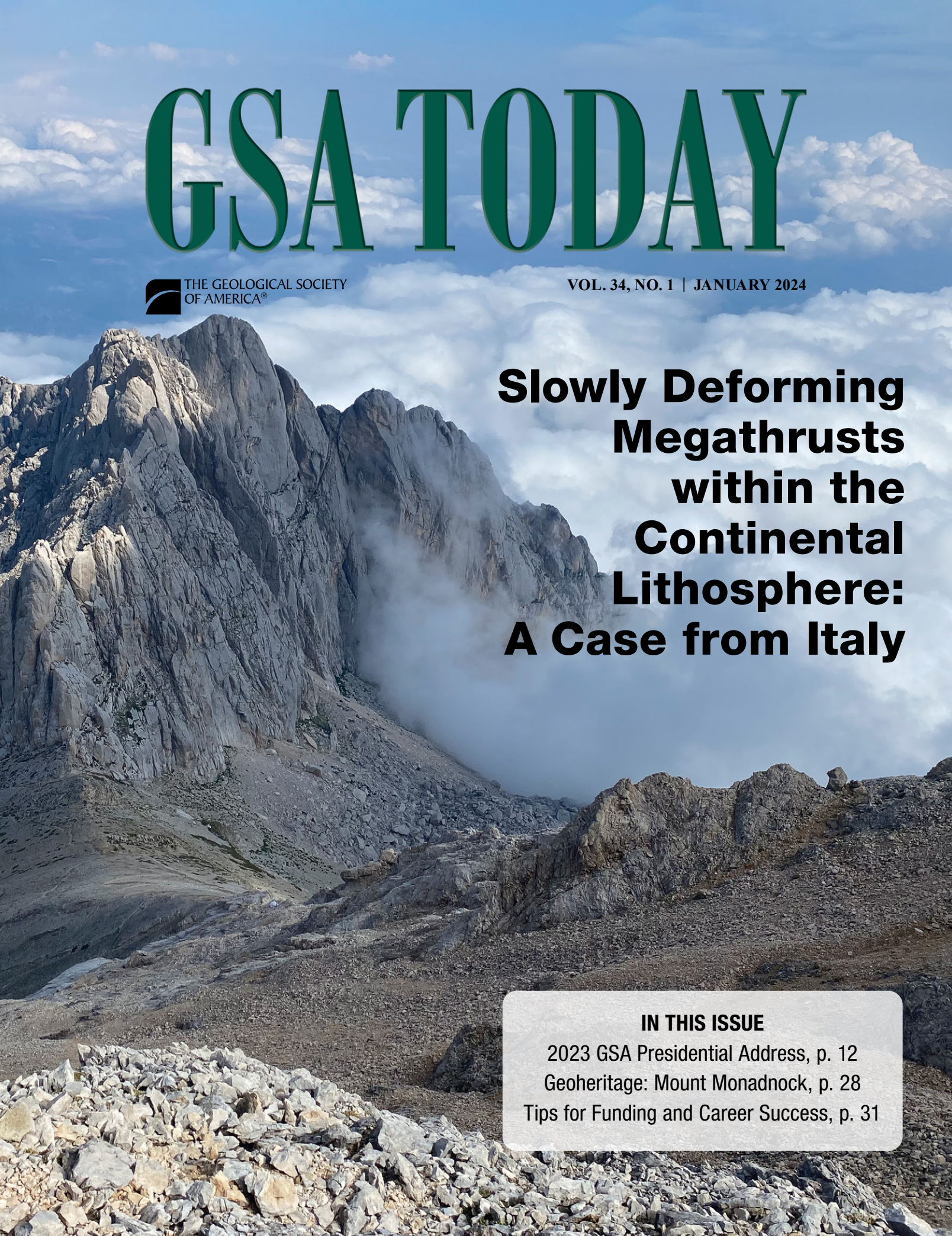

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VOL. 34, NO. 1 | JANUARY 2024

Slowly Deforming Megathrusts within the Continental Lithosphere: A Case from Italy

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JANUARY 2024 | VOLUME 34, NUMBER 1

GSA TODAY

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SCIENCE

GSA NEWS

ERRATUM: The December 2023 issue incorrectly listed the email address of John F. Slack, coorganizer of NEGSA technical session T31, as jfslack@gmail.com. The correct email address is jfslack@usgs.gov.

THE GEOLOGICAL SOCIETY OF AMERICA®

Slowly Deforming Megathrusts within the Continental Lithosphere: A Case from Italy

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ABSTRACT

The Late Pliocene–Quaternary Outer Thrust System of the Apennine-Maghrebides fold-and-thrust belt extends ~2000 km from northern Italy to Sicily. Its northernmost arc is seismically active and represents a test case to study geometries and seismogenesis of slowly deforming megathrusts developed within the continental lithosphere. Two distinct SW-dipping reverse shear zones (T1 and T2) in the Outer Thrust System of eastern Central Italy have been recently unveiled thanks to geological and integrated seismological information. These shear zones penetrate the Adria continental lithosphere to a maximum depth of ~60 km, with an outward convex shape associated with an outward-diverging radial pattern.

This paper presents new constraints on the megathrusts' geometry in light of a novel microseismic catalog (from 2009–2022) specifically focused on the compressional volume. Further details in the reconstruction of T1 and T2 are derived from a recent compressional seismic sequence (November 2022, M_W 5.5) located in the Adriatic offshore. It activated the outermost T1 upper crustal segment with pure compressional kinematics and illuminated T2 at lower crustal depths. We integrate geological sections, seismic lines, serial hypocentral cross sections, and focal mechanisms to build a detailed nonplanar 3-D model of the thrusts involved. In addition, we build Coulomb stress scenarios for analyzing the possibility of the static interplay between the upper crust T1 segment activated by the 2022 sequence and the underlying T2 crust segment. The overall results may be relevant for assessing seismic hazards in areas with multi-depth active structures and for gaining insights into plate tectonic dynamics.

INTRODUCTION

Megathrusts are reverse shear planes along subduction boundaries that can cause giant earthquakes ($M_W \geq 8.5$; Calais et al., 2016; Sippl et al., 2021). They are characterized by a long subduction zone with thick trench sediments, which promotes extensive lateral rupture propagation (Brizzi et al., 2018). While typically found in subduction zones, potentially seismogenic megathrusts can also develop within the continental lithosphere. We may consider two end-members: (1) highly deforming structures, such as the Himalayan collisional belt with thrust associated with strong upper crust earthquakes (e.g., 2015 Gorkha event, M_W 7.8; Elliott et al., 2016); and (2) slowly deforming continental regions (SDCR), such as the Mongolian region of the North China Craton, with long periods of seismic quiescence (Bollinger et al., 2021) or the Outer Thrust System (OTS) of Italy at the front of the Miocene to Quaternary Apennine-Maghrebides compressional belt, with moderate multi-depth earthquake activity (de Nardis et al., 2022).

The OTS is located within the active circum-Mediterranean contractional domain, which includes various fold-and-thrust systems, such as the southern Alps, Apennine-Maghrebides, Betics, and Dinarides-Hellenides. Seismogenic compression predominates at crustal depths (<35–40 km; Figs. 1A and 1B) but is also present within the uppermost mantle (35–70 km).

In central Italy, the basal thrust of the Adriatic fold-and-thrust belt is a known intra-continental shear zone that propagates at a low angle across the continental crust up to ~35 km beneath the Apennines (ABT in Lavecchia et al., 2003). The typical ABT thick-skinned style is well revealed by the CROP-03 near-vertical reflection profile (Pauselli et al., 2006). A blind lithospheric-scale megathrust sited beneath the ABT has been recently unveiled within the lower crust and upper mantle (25–60 km; de Nardis et al., 2022; Figs. 1C and 1D). Both thrusts, here referred to as T1 and T2, exhibit reverse-type microseismicity and minor thrust and strike-slip sequences with moderate historical and instrumental earthquakes (up to M_W 6.0–6.5; Rovida et al., 2022).

In November 2022, a moderate thrust sequence (M_W 5.5) activated the outermost upper crust splay of T1 offshore of Pesaro (Fig. 1B). This sequence, here called Bice after the name of the nearest deep drilling well (Progetto ViDEPI, 2016), is noteworthy for several reasons. First, it activated a previously aseismic T1 segment, providing new geometric and kinematic constraints. Second, it occurred where long-term deformation can be well reconstructed using available geological information. Finally, the Bice sequence illuminated T1 at depths of ~6–10 km and the underlying T2 portion at depths of ~20–25 km, suggesting the possibility of concurrent activity between the two thrusts.

In this paper, the fault releasing the Bice sequence was identified using seismic lines and seismicity data. A high-quality microseismic earthquake catalog for 2009–2022 (see Data Set S1 in the Supplemental Material[1]) was compiled to better constrain the geometry of T1 and T2. Coulomb scenarios of static stress propagation were also

[1]Supplemental Material. Figures S1–S8: Additional seismic activity models. Data Set S1: Catalog of high-quality hypocenter data. Please visit https://doi.org/10.1130/GSAT.S.24645996.v1 to access the supplemental material, and contact editing@geosociety.org with any questions.

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CITATION: Lavecchia, G., Pietrolungo, F., Bello, S., Talone, D., Pandolfi, C., Andrenacci, C., Carducci, A., and de Nardis, R., 2023, Slowly Deforming Megathrusts within the Continental Lithosphere: A Case from Italy: GSA Today, v. 34, p. 4–10, https://doi.org/10.1130/GSATG573A.1.

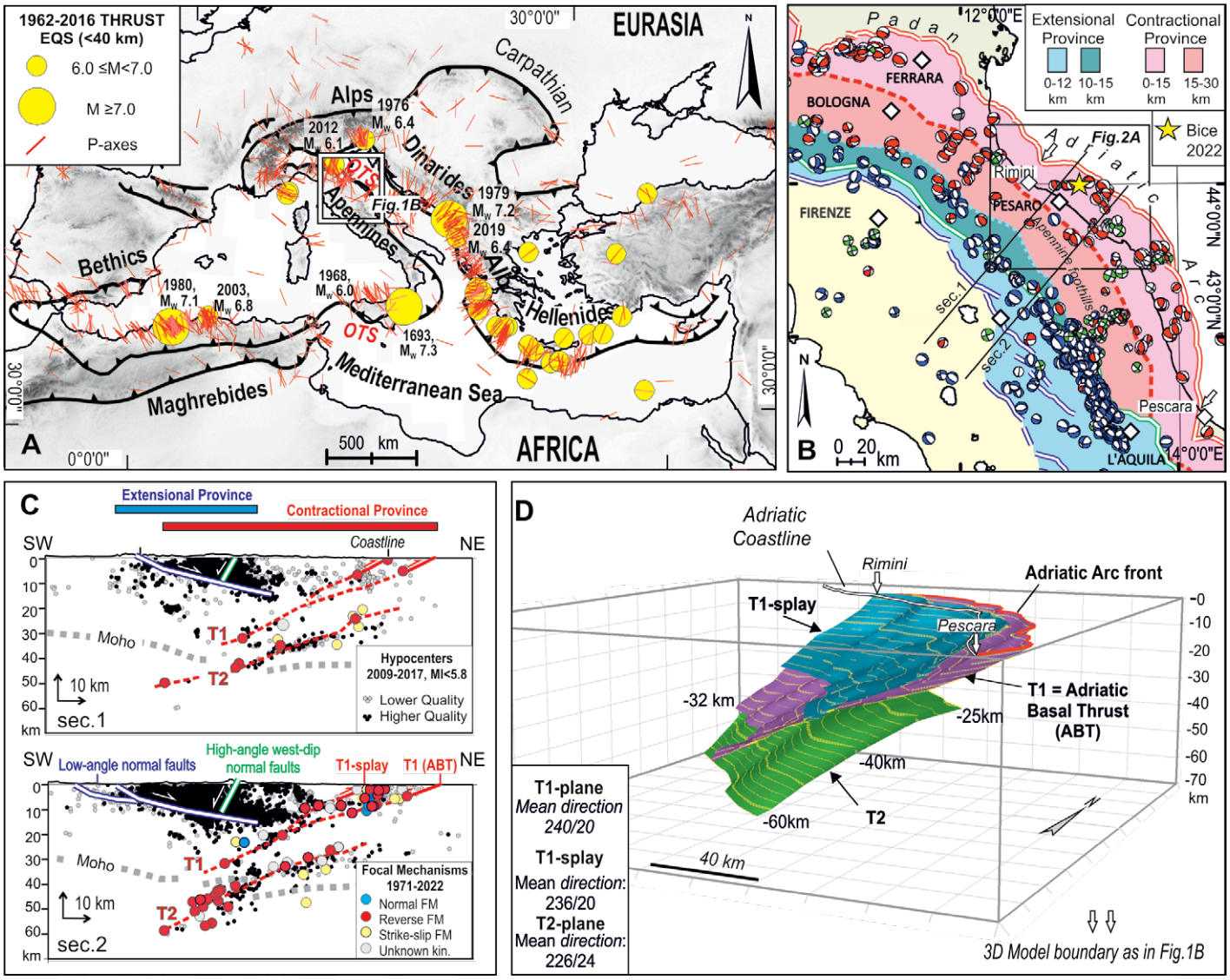

Figure 1. Seismotectonic framework. (A) Circum-Mediterranean crustal thrust earthquakes (World Stress Map database, Heidbach et al., 2018). (B) Seismotectonic provinces and focal mechanisms 1971–2022, depth <40 km (updated after Lavecchia et al., 2021). (C) Hypocentral sections with focal mechanisms and interpolated fault traces (dashed red lines), after de Nardis et al. (2022; projection semi width = 20 km, traces in Fig. 1B). (D) 3-D fault model of T1 and T2 megathrusts from de Nardis et al. (2022).

employed to investigate the hypothesis of interconnected activity between T1 and T2.

REGIONAL SEISMOTECTONIC FRAMEWORK

Late Pliocene–Quaternary active contraction in peninsular Italy is observed along with the OTS, which extends ~2500 km from the Padan region to Sicily (Fig. 1A). Along-strike, the OTS is characterized by two second-order major outer convex arcs: the NNE-to-ENE–verging northern Padan-Adriatic Arc and the SE-to-S–verging southern Ionian-Sicilian arc, linked by a linear segment in the southern Apennines (Petricca et al., 2019; Lavecchia et al., 2021). A similar arcuate pattern, at least to the base of the crust, is well depicted from the Moho contour-depth map, highlighting a deep connection between shallow and deep arcuate features (Cassinis et al., 2003). The Padan-Adriatic arc is organized in several third-order arcuate outer convex fold-and-thrust belts (e.g., Livani et al., 2018; Tibaldi et al., 2023). The central one, referred to as the Adriatic Arc, extends from Rimini offshore to Pescara for ~250 km (Fig. 1B). Perpendicular to strike, the Adriatic Arc is organized in two near-parallel and eastward rejuvenating, largely blind, major fold-and-thrust domains (Fig. S1A in the Supplemental Material). The internal domain is late Pliocene to Quaternary in age; it develops at the hanging wall of a regional inner splay of T1 (hereinafter T1-splay) and runs along and close to the Marche-Adriatic coastline. The external domain is Quaternary in age; it develops at the T1 hanging wall and runs entirely offshore, several kilometers east of the coastline.

Geological slip rates in the order of a few mm/yr characterized the Padan-Adriatic Arc in late Pliocene to early Pleistocene times, with a slip-rate deceleration to a few hundredths of mm/yr since Calabrian times (~1.0–1.5 m.y.; Maesano et al., 2015; Gunderson et al., 2018; Panara et al., 2021). Geodetic velocities show that present shortening occurs both beneath the Apennine Mountains range front at a rate of ~3 mm/yr

(Bennett et al., 2012) and along the Apennine frontal thrusts in a SW-NE direction at rates of 1.5–2.5 mm/yr, decreasing to ~0.5 mm/yr, corresponding to the outermost structures (Pezzo et al., 2020).

Available regional seismotectonic zonations (DISS Working Group, 2021; Lavecchia et al., 2021) highlight the ongoing contractional activity that occurs at upper-crustal depth within the Padan-Adriatic Province and deepens westward, reaching lower crust depths beneath the Apennine foothills (Figs. 1B and S1A). The fold structures are locally displaced by N-S right-lateral and E-W left-lateral strike-slip faults, splaying from the common basal detachment and functional to accommodate local arcuate shapes. The strike-slip deformation is synkinematic with the compressional one under a common near-horizontal SW-NE–shortening direction (de Nardis et al., 2022). Historical and instrumental seismic activity never exceeds M_W ~6.0–6.5 (Rovida et al., 2022; Latorre et al., 2023), with seismological strain rate values in the order of a few hundredths of mm/yr (Visini et al., 2010).

As during the whole Neogene–Quaternary history of outward migration of the Tyrrhenian-Apennine system, the ongoing contractional deformation is contemporaneous with near coaxial extension in the rear along the axis of the Apennine Mountains (Picotti and Pazzaglia, 2008; Barchi, 2010). The Extensional Province is characterized by a system of en-echelon, east-dipping, low-angle faults that propagate to depths of ~15 km and by synthetic and antithetic high-angle faults responsible for moderate to large earthquakes (M_W up to ~7.0; e.g., Trippetta et al., 2019; Lavecchia et al., 2021).

EARTHQUAKE DATA

The Bice Sequence

The Bice epicentral area is located ~35 km offshore Pesaro, within the external fold-and-thrust domain at the T1 hanging wall (Figs. 2A and S1A). Although largely blind, the geometry of such a system is well known at shallow depths (<5–6 km) because of the large number of commercial seismic lines

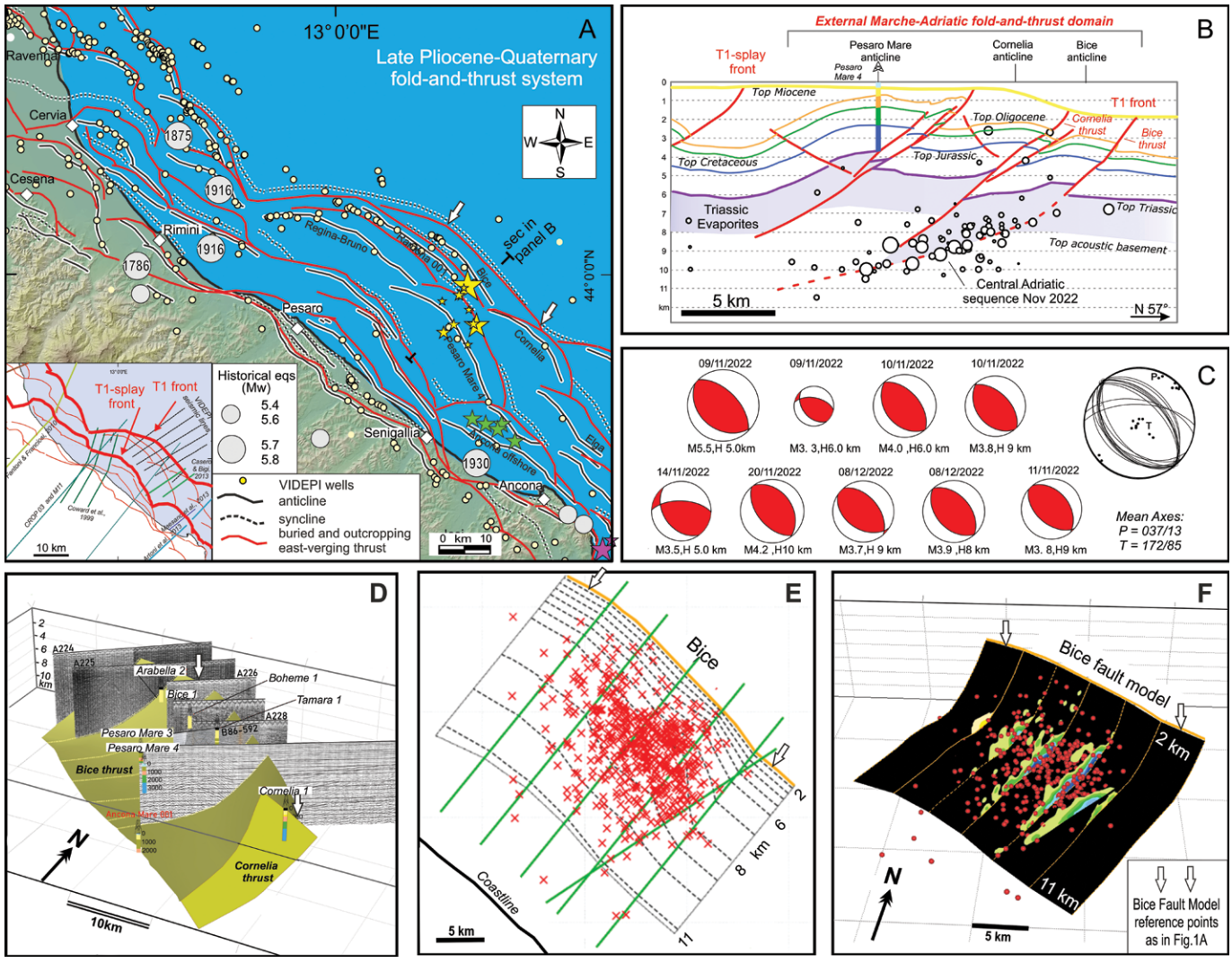

Figure 2. Tectonic framework and 3-D fault model of the Bice seismic sequence. (A) Marche-Adriatic late Pliocene–Quaternary fold-and-thrust system with historical earthquakes (Rovida et al., 2022) and major instrumental events (Bice 2022 = yellow stars: M_L 3.8–5.5 from http://terremoti.ingv.it/; Ancona 1972 = green stars: M_L 4.6–4.8; Ancona 2013 = purple stars: M_L 5.1 and 4.5). (B) Interpretative geological section (after Casero and Bigi, 2013) with Bice hypocenters in section view (semi-width 2.5 km). (C) Bice Time Domain Moment Tensor (TDMT) focal solutions from http://terremoti.ingv.it/. (D) 3-D view of ViDEPI seismic lines, Bice, and Cornelia thrust surfaces. (E) Bice epicentral distribution (9 November 2022–25 December 2022, 1.0 ≤M_L ≤5.5, depths ≤11 km) with traces of hypocentral serial sections and depth contour lines of the Bice fault model. (F) Bice 3-D-fault model with earthquake density contours projected along the sections (green lines in Fig. 2E). More details are in Figs. S2, S3, and S4 (see text footnote 1).

and boreholes available since the 1960s for oil exploration (e.g., Casero and Bigi, 2013).

The sequence started on 9 November 2022 with two major offshore events (M_W 5.5 and 5.2) enucleated within 1 min ~8 km away in map view (Figs. 2A and S2). The sequence ended on 15 January 2023 (http://terremoti.ingv.it/; Fig. S2). During the first ten days, ~395 earthquakes occurred ($0.9 \leq M_l \leq 4.0$), identifying a SW-dipping low-angle (~20°) seismogenic volume at depths between ~6–7 and 10–11 km (Fig. 2B).

During the overall time interval of the Bice sequence and within the same epicentral area, the Istituto Nazionale di Geofisica e Vulcanologia (INGV) seismic network also recorded background seismic activity at depths of 20–30 km ($1.0 \leq M_l \leq 2.8$; Fig. S2). The focal mechanisms of the sequence were almost pure dip-slip with an average SW-NE near-horizontal average P-axis (Fig. 2C), consistent with the ~N040 max horizontal stress direction calculated from breakouts (Montone and Mariucci, 2023).

The Megathrust Seismicity

The geometry of the T1 and T2 megathrusts, first outlined by de Nardis et al. (2022; Fig. 1D), is here further constrained and detailed in light of a novel compilation of high-quality data recorded by the Central Eastern Italy Seismometric Network (ReSIICO; Cattaneo et al., 2019) in the time interval from 2 August 2009 to 30 September 2022. The seismic events, having $0.0 \leq M_l \leq 5.8$ and depths <60 km, were recorded with good coverage by 103 seismic ReSIICO stations integrated with the Italian seismic network (RSN). The events were relocated using the probabilistic nonlinear global search inversion approach of Lomax et al. (2000). Methodologies for relocation and quality of the seismic data are described in de Nardis et al. (2022).

From the 2009–2022 data set, we selected a sub–data set of events located within a SW-dipping crustal volume between 10 km at the roof of T1 and 10 km at the bed of T2.

Such a novel microseismic catalog, representative of the lithospheric scale compressional seismogenic volume associated with the OTS of Central Italy, is made available in the Supplemental Material (Data Set S1; Figs. 3A and S5). It includes 9632 earthquakes with $-0.6 \leq M_W \leq 4.8$ and depths 0–60 km. Formal vertical and horizontal errors are <2 km for ~92% of the data (see Fig. S5). For the same hypocentral volume, we extracted the corresponding focal mechanisms associated with either T1 and T2 from de Nardis et al. (2022) and integrated them with focal mechanisms from Mariucci and Montone (2020; Fig. S1B). The stress tensor inversion is represented in Figure 3B.

METHODS

A nonplanar fault model of the seismogenic structures activated by the Bice sequence (Fig. 2) is built with a multistep methodological approach (e.g., Bello et al., 2021; Tibaldi et al., 2023), integrating geological and geophysical data. Considering available geological maps and sections, seismic lines, and boreholes available from the literature and imported into an ArcGIS project (Fig. S3), we performed the following steps:

1. Updated the fold-and-thrust structural map (Fig. 2A) and elaborated an interpretive geologic section across the hypocentral area (Fig. 2B);
2. Selected transversal and longitudinal seismic lines from the ViDEPI database and used them to interpret the section view geometry of the Bice thrust and of the neighboring Cornelia thrust (https://www.videpi.com; Figs. 2D and S4);
3. Computed the kernel density estimation of the Bice seismic events projected along seven 10 km-spaced cross sections perpendicular to the structural trends by applying the Silverman (1986) kernel function (Fig. 2F); and
4. Interpolated the Bice thrust near-surface trace, the Bice fault traces, identified on the seismic lines (Fig. S3) and from the hypocentral distributions (Fig. 2), and built a 3-D nonplanar fault model (Figs. 2D, 2E, and 2F).

In addition, to validate the T1 and T2 megathrust geometries constrained from seismological data with independent information (Fig. 3), we projected the earthquake data along the trace of the onshore CROP-03 and offshore MS16 near-vertical seismic profiles (Fig. 4A) and verified their correspondence with identifiable thrust reflectors.

We also performed possible Coulomb stress transfer scenarios from a hypothetical

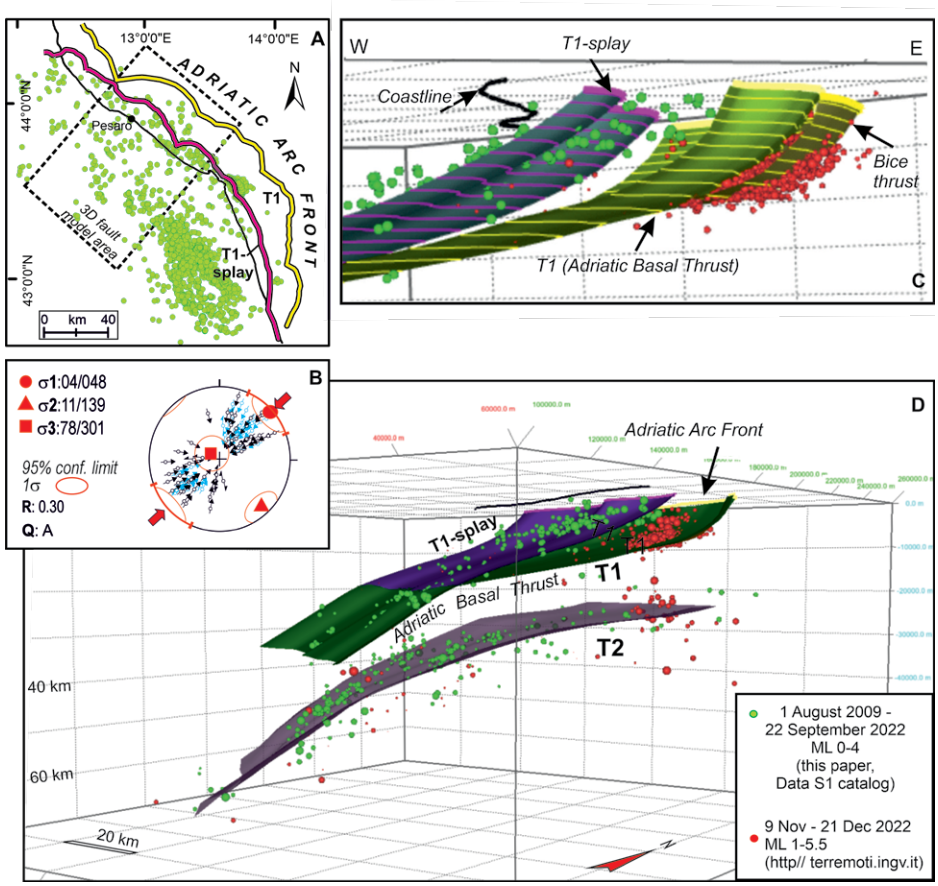

Figure 3. Updated 3-D seismotectonic fault model of T1 and T2 megathrusts and T1-splays. (A) OTS_EQS Catalog (2009–2022, Fig. S5) with a selection of events (green) associated with T1 and T2. (B) Stress tensor from focal mechanisms associated with T1 and T2 (from de Nardis et al., 2022). (C, D) 3-D view from SE of T1 and T2 with a zoom on Bice thrust and T1-splay. Geometric and kinematic parameters in Fig. S7 (see text footnote 1).

earthquake occurring on T1. We simulated an M_W 6.2 event nucleated at upper-crustal depths on the T1, given that it is considered responsible for historical and instrumental thrust earthquakes at upper- and lower-crustal depths, with equivalent M up to 6.0–6.5 (e.g., Rovida et al., 2022; Fig. S1). We used Coulomb code 3.4 (Lin and Stein, 2004), considering a bull's-eye slip distribution on the fault plane, and computed the imparted stress on the surrounding faults. We assumed the average geometry parameters retrieved by Bice and T1 fault models here reconstructed (220° striking, 22° dipping finite faults; Fig. 3C). Specifically, we consider a source ~14-km-long and 7-km-wide (downdip width), as suggested by the scaling law for events of such magnitude (Wells and Coppersmith, 1994). Furthermore, we assumed a friction coefficient (μ) of 0.4. Finally, we analyzed the results considering the stress changes for four simulated seismic sources at different depths (Fig. S7).

RESULTS

The Bice 3-D Fault Model

The style reconstructed for the structures hosting the Bice sequence is typical of a fault-propagation-fold system and consists of three en-echelon buckle folds with underlying thrusts (Pesaro Mare, Cornelia, and Bice) detaching on a SW-dipping basal detachment (Fig. 2B). The latter propagates with staircase trajectories from the Permian–Triassic basement (10–15 km depth) up to near-surface depths and represents the outermost upper-crust splay of the T1 megathrust.

In map-view, the Bice thrust trace can be identified for an along-strike extent of ~30 km in the NW-SE direction; southward, it converges with the Cornelia right-lateral en-echelon thrust (Figs. 2A and S3E). In section-view and 3-D-view, a listric Bice geometry is evident, with an average dip angle of ~40° from near surface to a depth of 7 km and ~20° at seismogenic depths, from 7 to 11 km (Figs. 2B and 2E).

The central and southern portion of the Bice thrust, for a length of ~20 km, released most of the events of the November 2022 aftershock sequence; nonetheless, the intermediate Cornelia thrust was subordinately activated in its northernmost portion overlapping with Bice (Figs. 2A, 2B, and S4). The main event (M_W 5.5) nucleated on the Bice thrust; the second one (M_W 5.2) was at the intersection between Bice and Cornelia.

Whereas the Cornelia thrust was known in the previous reconstructions (Casero and Bigi, 2013) and highlighted in recent ones (Maesano et al., 2023), the seismogenic role of the Bice thrust has been underevaluated. This structure is especially interesting from a seismic hazard point of view because it intercepts two deep extraction wells (Bice 1, 4322 m, and Tamara 1, 3216 m; Fig. 1A), reopening the triggered and induced seismicity question (Lavecchia et al., 2015).

The Megathrust Fault Models

The hypocentral distribution from Data Set S1 helps reinforce the megathrust images in de Nardis et al. (2022), with additional information relevant to structural interpretation.

The T1 and T1-splay hypocentral distribution present a bimodal pattern with events mainly located at upper crust (0–8 km) and middle crust (13–22 km) depths. The regional T1-splay branches from T1 at a consistent depth of ~20 km and represents the basal detachment of the internal fold-and-thrust domain of the Adriatic Arc, T1 being the basal detachment of the external fold-and-thrust domain of the Adriatic Arc (Figs. S1A and 3). T2 is continuously illuminated from middle crust to upper mantle depths (~20–60 km) for an along-strike extent of at least 250 km.

The 3-D megathrust models revised in this paper focus on the northern sector of the Adriatic where the Bice sequence was released (Fig. 3). The green hypocenters in Figure 3 refer to Data Set S1; the red ones are extracted from the INGV list of earthquakes (http://terremoti.ingv.it) during the time interval of the Bice sequence activity (1 November–25 December 2022; Fig. 3). Clustered events from Data Set S1 and the Bice seismic sequence contemporaneously nucleated on T1 and T2 (Figs. S2 and S5).

The earthquake-constrained T1 and T2 megathrust surfaces (Fig. 3) fit well with the geometries highlighted along the trace of the CROP-03 and MS16 seismic profiles (Fig. 4A). In particular, the upper and lower

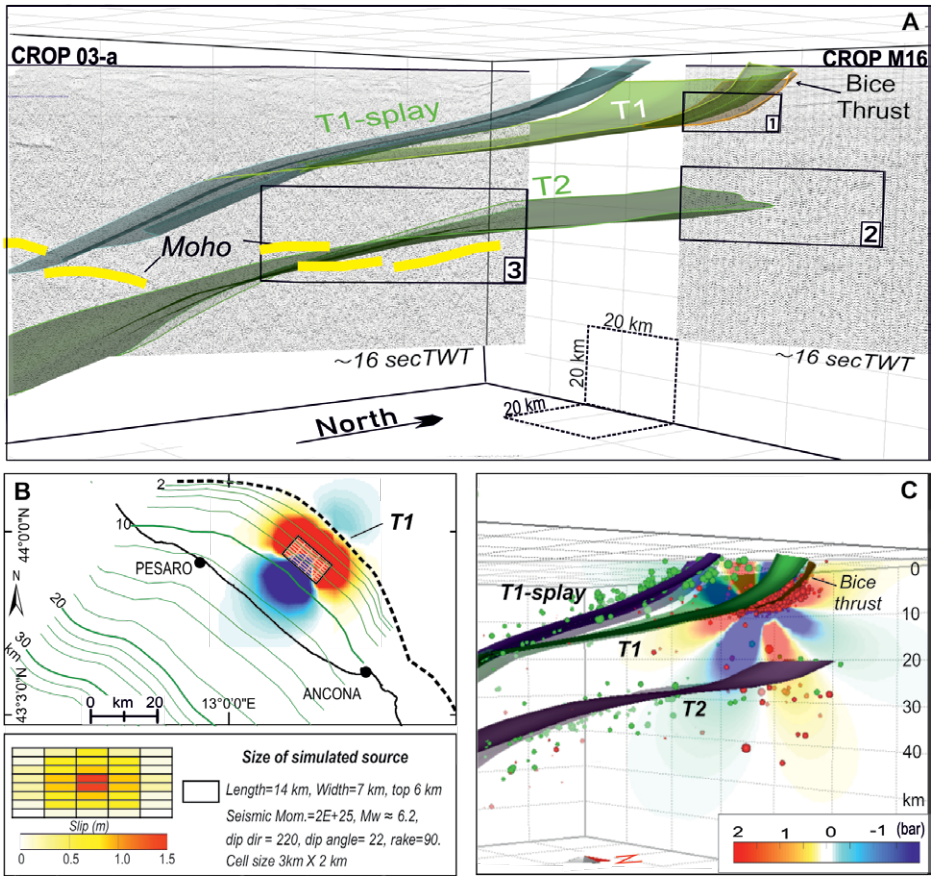

Figure 4. Near-vertical seismic lines across T1 and T2 and Coulomb stress scenario for a thrust earthquake nucleated on T1, near the Bice fault. (A) Near-vertical seismic profiles across the earthquake-constrained fault models (https://www.videpi.com/videpi/crop/crop.asp; details 1, 2, and 3 in Fig. S6). (B, C) Map- and section-view Coulomb stress simulation for a M_W 6.2 event (Coulomb code 3.4; Lin and Stein, 2004) (other scenarios in Fig. S8). The colored dots legend of panel C is the same as in Figure 3D.

crust T2 segments fit well with thrust deformation evident in the CROP-03 seismic line at Moho depths (35 km) and in the MS16 seismic line within the upper part of the lower crust (20–25 km; Fig. 4A). Details are given in Figure S6, and parametric data are given in Figure S7.

Scenarios of Fault Interaction

The coexistence of T1, T1-splay, and T2 at different depths within the same lithospheric volume and under the same stress field raises questions about potential stress interaction during an ongoing seismic sequence. Starting from the reconstructed 3-D fault models, we investigate the likelihood of static stress interactions among the above structures (Figs. 4 and S7).

Modeled Coulomb stress scenarios show that slip on T1 increases the stress on nearby zones, both along the dip and perpendicular to the dip (Figs. 4C and S8). Therefore, it can trigger secondary slip at lower depths and can be responsible for broadly off-fault aftershock activity on T2, as observed during the Bice sequence (Fig. 3D). Conversely, lateral Coulomb stress transfer from T1 toward T1-splay does not appear to be triggered in the here-modeled scenarios, suggesting that T1 and T1-splay act independently (Fig. S8).

DISCUSSION AND CONCLUSIONS

In this paper, we provide further insights into the geometric multi-scale complexities of slowly deforming continental regions (SDCR) with a case study from the orogenic belt of eastern Central Italy. Most often, SDCR geometries remain controversial, because it is possible to infer them only after large earthquakes, either through earthquake data or surface seismic deformation (Bollinger et al., 2021; Laporte et al., 2021). The seismic activity is widely spread across the rock volume and is thought to result from transient stress perturbations or changes in fault strength, which lead to the release of accumulated strain within the prestressed lithosphere (Calais et al., 2016). In the Italian case, the regional stress driving the compressional deformation since the late Pliocene (Lavecchia et al., 1994) is still active (de Nardis et al., 2022), and the microseismicity occurs around distinct shear planes, specifically T1 and T2.

T1 and T2 represent an uncommon example of a double reverse shear zone at lithospheric depths, because such configurations are commonly imaged at intermediate depths in subduction zones. Their reconstructed 3-D configuration allows us to speculate on points that may be essential to reduce uncertainties in seismic hazard assessment (Pandolfi et al., 2023): (1) strain partitioning, (2) vertical stress triggering, and (3) seismogenic potential at the outer Apennine front.

1. The coexistence in the Adriatic continental lithosphere of two multi-depth megathrusts may imply a strain partitioning on the two structures, thus slowing individual seismogenic deformation rates. In such a frame, the observed slowdown of the compressional rate at the T1 hanging wall since the middle Pleistocene might be the result of the underlying growth of the T2 blind structure, which is too deep to modify the surface strain rate field (Picotti and Pazzaglia, 2008; Gunderson et al., 2018).
2. The interconnected T1 and T2 seismic activity shows rare evidence of vertical stress transfer between fault structures at different crustal depths during moderate earthquakes (M_W 5.5–6.5). Highlighted cases of vertical stress interaction are usually associated with strong earthquakes (e.g., 2016 M_W 7.8 Kaikōura earthquake in New Zealand; Lanza et al., 2019), whereas stress triggering during moderate earthquakes mainly develops along strike or dip of segmented structures (e.g., 2016 M_W 5.9 thrust Menyuan Earthquake in the Qilian Orogen of China; Zhang et al., 2020).
3. In the past 2000 yr, only a few events in the Adriatic Arc area reached M_W ~6.0, occurring both near the coast (e.g., Senigallia in 1930, M_W 5.8) and more internally (e.g., Fabriano in 1741, M_W 6.2; Rovida et al., 2022). Based on the analysis of attenuation curves and an empirical law relating epicentral intensity to depth and magnitude, the Fabriano earthquake has been deepened to ~35 km (see Fig. S1A for epicenteral location), with an increase in magnitude up to M_W 6.3–6.4 (Sbarra et al., 2022). With the new hypocentral coordinates, the event falls on T2, raising the issue of the seismogenic role of T2. Furthermore, because SDCR have long seismic cycles that may last thousands of years (Bollinger et al., 2021), we cannot exclude the occurrence in the past or future of highly destructive events, such as, for example, the 1693 earthquake offshore eastern Sicily (M_W 7.3; 60,000 casualties; Rovida et al., 2022), which might be associated with a Sicilian segment of the OTS (Fig. 1A; Petricca et al., 2019).

The knowledge of structural complexities at a 3-D scale and their analysis in terms of strain partitioning and stress transfer is especially relevant in slowly deforming intra-continental regions as they may help to reveal more complex, unexpected, and even highly seismogenic scenarios with evident implications for seismic hazard assessments, as well as for a deeper understanding of geodynamic processes.

ACKNOWLEDGMENTS

The Central Eastern Italy Seismometric Network (ReSIICO), and especially Daniele Marzorati, Marco Cattaneo, and Giancarlo Monachesi, are acknowledged for providing seismic data from the Marche-Adriatic region. In addition, we sincerely thank editor Peter Copeland, an anonymous reviewer, and Frank Pazzaglia for their constructive suggestions, which helped in improving the original version of the manuscript.

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Manuscript received 27 April 2023
Revised manuscript received 10 August 2023
Manuscript accepted 6 November 2023

Geoscience at the Confluence

Christopher (Chuck) Bailey

Greetings and welcome to GSA Connects. These meetings are a rush of activity. There's more to do than one can do—I appreciate you being here today as we come together to celebrate the accomplishments of our members as well as to reflect upon the Society and our science.

Here's an update on the Society. It was nearly a year ago that Melanie Brandt joined GSA as its executive director and CEO. Melanie is fabulous; she's brought energy and new ideas to the Society. Although Melanie's not a geologist, her experience growing professional societies is impressive. I've learned much from working with her on GSA business, plus I've gained a new perspective on corporate vernacular. For example, I now know stuff like whether or not "the juice is worth the squeeze." Spoiler alert: It isn't. I'm also fortunate to collaborate with Debbie Marcinkowski, executive director of the Foundation, as they work tirelessly to support GSA's mission.

The Society is focused on diversifying, retaining, and energizing its membership, we're expanding our international activities, and we have new publication projects in the works to amplify GSA's public presence. If you want to talk more about GSA's plans, be in touch.

We're in Pittsburgh at the confluence of the Allegheny and Monongahela Rivers which join to become the mighty Ohio River. These are important American rivers. The Allegheny River arises, in part, from the glaciated terrain of northern Pennsylvania and New York. To learn more about this watershed, and one of America's last big dams, I encourage you to attend tomorrow's Pardee session titled, "Land of Our Ancestors, Submerged by a Lake of Betrayal." Two hundred kilometers south of here, beneath the high ridges of an old landscape, the Monongahela's tributaries commence, tumbling through gorges of impressive whitewater on their northward journey to Pittsburgh.

Pittsburgh owes its existence to this confluence of rivers. These watery ribbons form a transportation network across the rugged landscape of the Appalachian Plateau. This confluence was long traversed by First Nations people; later, European settler colonists crossed the Appalachians and came down these rivers. In the nineteenth century, the mineral wealth hidden in the region's Paleozoic strata was discovered, extracted, and put to work. Pittsburgh, the Steel City, became a major industrial hub because it sits at the confluence of rivers, enabling the easy ingress of raw materials and egress of the products from which to forge an empire.

Today, I want to talk about something that I've been ruminating over for some time: the idea of confluence in a broader sense. You know how when you hear a particular song, you're immediately transported to that confluence of a specific time and place?

Curiously enough, I first heard "Age of Aquarius" by the 5th Dimension on a cassette tape while driving an old four-speed manual Chevy pickup truck across the flanks of Utah's Aquarius Plateau. Every time I hear that song it takes me back to that time and place. It was 1987, I was in a field course that roamed over the Colorado Plateau—it's the place where young geologists can go to actually "see" geology. And for me, that experience was transformative.

The magical power of confluence in time and place that certain songs create strikes me as being an equally powerful concept in geology. Today, I'm going to build on this idea of confluence. Geology is a science at the confluence. As a field of study, whether its academic or applied, geology sits at the confluence of time and place. And in many ways, this makes the geosciences unique.

Aerial view of Pittsburgh, Pennsylvania, 1902. Created by T. M. Fowler & James B. Moyer. Courtesy of the Library of Congress.

"My take home message is this: geoscience, situated at the confluence of time and place, is the science that deciphers the past, understands the modern processes that shape our planet, and brings perspective to a rapidly changing world."

Scan the QR code to watch a recording of Chuck Bailey's Presidential Address at GSA Connects 2023.

For me, and I expect for many of you here, that mix of time and place is what attracted us to the science. The temporal nature of geology, with its focus on the past, but also firmly rooted in the present with an eye to the future, is compelling stuff.

What follows are narratives about my path to, and career in, geology. I hope these stories aren't boorish yarns from an aging scientist, but rather an arc that celebrates learning, excitement, and discovery. As a student it was clear to me that there were discoveries to be made in the geosciences, and three decades later I feel the same way. Discovery, at this confluence of time and place, perhaps contextualized by a good story or two, makes our science both engaging and relevant.

During my first semester in college, pretty much as a lark, I took an introductory geology course. That class, taught by Heather Macdonald, changed my life. It was an early class, 8 a.m. early, but Heather's a gifted teacher who made the geology cool enough for me to wake up for it every day. The course's lab component was traditional, in an old-school way, meaning there were piles of rocks in boxes plus a dizzying array of topographic maps that we were tasked with analyzing and hopefully understanding. No doubt some of you experienced something similar in your geological upbringing.

One particular lab exercise involved using the topographic map of the Mammoth Cave 15 ft quadrangle in Kentucky to answer questions on a worksheet; the idea was to get us to recognize the karstic nature of this terrain with its caverns, disappearing streams and sinkholes. In the northern reaches of that map the Green River meanders across the terrain. Seeing it on this map, I can hear John Prine singing about [the river] in his song "Paradise."

There's that confluence again. Not just the confluence of time and place in the geological record, or in the time machine of hearing an old song, but in the confluence of music and memory and storytelling and the study of geology that connects me deeply to this discipline. Never underestimate the power of a musical interlude to move a lecture forward or perhaps reawaken a fading audience.

John Prine's "Paradise" also transports me back to my adolescence as a summer camper at Nature Camp, where it was sung many times. We were witty, so we commonly changed the lyrics from "Mr. Peabody's Coal Train" to "Mr. Coalbody's Pea Train," and it still makes me giggle. The song itself laments environmental degradation caused by strip mining. As a first-year geology student, it was this confluence of "seeing" the terrain on an old map and Prine's classic ballad that demonstrated geology's importance. The character of a landscape is determined by its geology; its stratigraphy and its structure make all the difference. In Kentucky's humid climate, Mississippian limestones melt away to form caverns and blind valleys while nearby, in younger Pennsylvanian strata, coal is plentiful enough—here, as Prine notes, "with the world's largest shovel they tortured the timber and stripped off the land" to reach the black pay dirt, all to stoke the fires of "progress."

As we look to the future, it's clear that our collective demand for Earth materials is escalating. Two years ago, at Barb Dutrow's Presidential Address, she demonstrated how minerals matter. Mining, an inherently extractive process, is only going to grow; we may not want the world's largest shovels to dig out coal anymore, but we're smitten with spodumene crystals and the lithium held within. How, as stewards of this planet, can we mine for a sustainable future? Geoscientists and GSA have a responsibility to both lead the effort to discover the critical minerals that'll power a greener future and find the solutions that ameliorate mining's pernicious side effects.

As a young faculty member, I took my first field course to Fish Lake, a place that I'd been introduced to as a student back in 1987. Fish Lake is Utah's largest alpine lake, situated in a broad valley at 9,000 ft above sea level. Here we'd hike to the top of the Pelican Canyon moraine with its broad view of the lake. Few of my students realized that we were on a moraine; so much for all that learning from topographic maps back in the lab. As an educator, I can attest that place-based experience counts for a lot. After discerning the origin of the moraine, I'd lob question upon question at my students: When did the moraine form? When did Fish Lake form? How was the valley created?

"I'd like to see GSA work with researchers to broaden the audience and amplify the scope of their new geoscience discoveries. This is important, as in an era of declining trust in science and fact, geoscientists must work to be out in the public, explaining our science and its relevance for our future on this planet."

I thought my pedagogy plenty clever, but after a few field course visits to Fish Lake, I realized that many of those questions had never been properly answered. This landscape looked tectonically "young," but the Colorado Plateau and its adjoining High Plateaus aren't known for their seismicity. So began a research quest to understand the landscape history and tectonics of the High Plateaus.

With support from the National Science Foundation, we took our first full cohort of undergraduate researchers to the Fish Lake Plateau in 2005. We tramped across the high country, working out its volcanic stratigraphy while mapping more graben than I can recall. From the comfort of a pontoon boat, my friend Scott Harris surveyed the bathymetry of Fish Lake. Mild-mannered Dave Marchetti sampled boulders on moraines and terraces for cosmogenic exposure age dating. It may not have been the age of Aquarius, but it was an age of discovery and there was joy in that discovery.

Scott's mapping revealed that Fish Lake's waters hid a second older moraine complex. Exposure ages provide the chronology of >400,000 years of tectonic, fluvial, and glacial activity on this landscape, including young fault scarps that cut 20,000-year-old moraines. This research, conducted by a handful of faculty and a score of undergraduates, brought forth new knowledge about Utah's enigmatic High Plateaus. Research that's been published in the professional literature and discussed at GSA meetings. I'd like to see GSA work with researchers to broaden the audience and amplify the scope of their new geoscience discoveries. This is important, as in an era of declining trust in science and fact, geoscientists must work to be out in the public, explaining our science and its relevance for our future on this planet. And as a Society we must better support the early career geoscientists who do outward-facing and impactful science. Relying primarily on the H-index as a metric of scientific success and productivity is problematic—we can and should do better.

Virginia is well-watered and covered by greenery, effectively warding off geologists from west of the 100th Meridian. However, its geological terranes are compelling. When I first conceived of this talk, I struggled as to what snippet of Virginia geology to share—should it be glimpses of a Snowball Earth preserved in

700-million-year-old glaciogenic rocks, or a Taconian mélange formed as Gondawanan arcs crashed onto North American shores?

Ultimately, I chose an ongoing research project at Highland, an antebellum plantation in the eastern Blue Ridge foothills near Charlottesville. Highland was, for a time, home to America's fifth president, James Monroe. Collectively, what do we remember of James Monroe? Perhaps the Monroe Doctrine, viewed by many as a forward-looking policy that effectively turned the western hemisphere into the United States's sphere or a policy that fomented U.S. hegemony, leaving a legacy of poor countries throughout Central and South America. Monroe was a William & Mary student but dropped out to fight in the American Revolution. He was the youngest of the Founding Fathers, and he was a slave owner. His two-term presidency ran from 1817 to 1824; that's two hundred years ago, and it's known to historians as the Era of Good Feelings. Perhaps one day my GSA presidency will have that same moniker.

"Subjugation and freedom, prosperity and poverty—geology has played its role in this dichotomy throughout history. It's incumbent upon today's geoscientists to use a critical lens to discover those linkages and to tell stories such as this."

The duo formerly known as Mandolin Orange [reflects] on American history [in the song "Wildfire."] "It should've been different; it could have been easy"—from the American Revolution to the Civil War. And to my way of thinking, that sentiment still resonates today as we reckon with our national history.

Last year at Monroe's old plantation, the 27 students in my Field Methods course undertook a semester-long project to study the bedrock geology, geomorphology, and landscape history at Highland. Our goal was to connect deep time with human time in this historic place.

The geology at Highland falls short of spectacular. The property is primarily underlain by meta-basaltic greenstones of the Catoctin Formation, but outcrops are few and far between as the landscape is typically covered by a distinctive reddish soil. However, these ultisols are flush with base cations yielding highly fertile silty loams. It's no accident that three American presidents had large plantations sited on the Catoctin Formation rather than on the poor soils developed on the ubiquitous phyllites and schists of the Piedmont.

About 570 million years ago, the Catoctin basalts flooded a barren Ediacaran landscape. Ultimately these flows were the harbinger of a new ocean basin—the Iapetus Ocean, which tore Laurentia apart as it grew. In central Virginia, the pillow lavas and breccias at the top of the Catoctin Formation provide the critical evidence of Iapetus's watery advance.

Yet, it's not all greenstone at Highland; interlayered within the metabasalt are sheets of metamorphosed arkosic sandstone and siltstone. These fluvial deposits are derived from the erosion Grenvillian granitic rocks in highlands to the west. The stratigraphy hints at the dynamic interplay between rifting, sedimentation, and volcanism.

Highland is a different kind of historic destination, in contrast to Washington's Mount Vernon, or Jefferson's Monticello—there is no big house of the "great" man to be seen or toured. For years there was controversy about the lack of the big house at Highland. Monroe sold the property in 1825 and a later owner constructed the still-standing Victorian-era farmhouse. To the casual visitor, Highland seems a confusing mishmash of multi-era architecture.

But in 2016, archaeologist Sara Bon-Harper and her team discovered the foundation of Monroe's original house, built in 1799. The foundation of that structure endures, a foot or two below the surface, more or less in the front yard of the Victorian-era farmhouse. We now know that a fire destroyed the original house. What remains of Monroe's house is primarily its stone foundation, and much of that foundation is meta-arkose, locally derived arkose. The arkose's tendency to form rectangular blocks, bound by joint and vein sets, makes it well-suited for foundation stone.

Hidden in a grove of red cedars, and just a few hundred meters from the old foundation, William & Mary students discovered the remnants of a quarry cut into a regularly jointed but massive meta-arkose. Petrographic analysis of samples from the foundation and the old quarry are identical. We're stoked to have located the source of the foundation stone. Joy in discovery and, in this case, connecting deep time to the early days of the American Republic—to me, that's geoheritage.

Here's a toolmark created during the quarrying of that arkose. Whose labor created that toolmark? Who quarried these stones and transported those blocks to the house site? James Monroe's work at Highland was done by enslaved people, and that's a big part of the story at nineteenth-century sites across the southern United States. Subjugation and freedom, prosperity and poverty—geology has played its role in this dichotomy throughout history. It's incumbent upon today's geoscientists to use a critical lens to discover those linkages and to tell stories such as this. Geoheritage is having its moment, but for geoheritage to gain traction beyond the geologically inclined, we need to intentionally bridge that gap between deep time and human history.

Long past tenure, I realized that I'd spent my career studying continental rocks. Yes, we're rooted to the continents, but the world is a big place. I thought it'd be worthwhile to examine rocks and structures formed elsewhere on Earth. Ophiolites fit the bill, as these enigmatic bits of oceanic crust and mantle are vastly different from anything I'd ever studied. A decade ago I made my first pilgrimage to see ophiolite, in the Al Hajar of northern Oman. Here the world's largest and best-preserved ophiolite is well-exposed.

Oman is a unique country. It's ancient and traditional in so many ways, but it's also a country that's raced into modernity over the past three decades. Oman's renaissance is financed by oil and gas pumped from beneath its interior deserts; once again the confluence of deep time and place come together to forge civil change.

My original research goal was to examine the basal thrust zone. It's a massive fault upon which the ophiolite was emplaced onto crustal rocks as the Tethys Ocean closed during the Cretaceous. Hot rocks from the mantle were juxtaposed over seafloor sediments and lavas, heating and deforming those rocks into a metamorphic sole glued to the base of the ophiolite.

While traversing to our field sites, we'd encounter a weird rock—a reddish orange rock that held up craggy hills and rocky fins. This rock "got in the way" as we climbed over and around it to reach the metamorphic sole. The rock is listwaenite, and at first, listwaenite was of no interest to me. It's a troublesome rock; even its spelling causes angst. Regardless of how it's spelled, listwaenite is a carbonated peridotite composed of the minerals magnesite, dolomite, quartz, and hematite.

Where does listwaenite form? Some researchers maintain that listwaenite developed in the mantle wedge during the emplacement

of the ophiolite and thus represents a sink for carbon in the deep Earth. Yet Oman's listwaenite is almost always exposed at the base of the ophiolite, and as our research demonstrates, associated with upper-crustal extensional fault zones that post-date ophiolite obduction. Here, the geological structure, with serpentine-rich peridotites in tectonic contact above Mesozoic carbonate rocks, provides a readily available source of carbon-rich fluids to course through dilational fault zones, effectively "listwaenitizing" peridotites.

Why does listwaenite matter? Well, it's a fully carbonated peridotite that snatched carbon from the hydrosphere, sequestering carbon back into the rock record. Could this geological process be replicated in real time, such that the vast ophiolite could form a viable sink for atmospheric carbon? That's an important geo-engineering challenge, but success could yield substantive gains that work to lower atmospheric CO_2 levels. Geoscientists need to be a part of this effort, blurring the line between academic and applied research for the greater good.

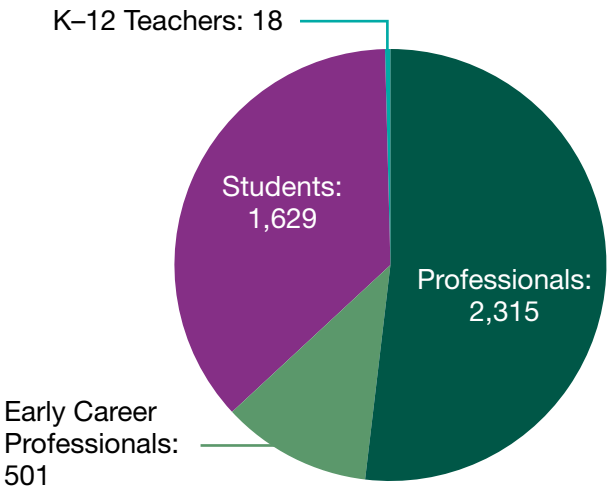
Thanks for staying with me throughout this free-ranging talk. Your forbearance with my anecdotes is appreciated. My take home message is this: geoscience, situated at the confluence of time and place, is the science that deciphers the past, understands the modern processes that shape our planet, and brings perspective to a rapidly changing world. Let's take joy in, and celebrate, our collective geoscience discoveries. But let's also lean in and lift up to amplify our voices so as to broaden the reach and relevance of the geosciences, as I believe that's imperative for a sustainable future on Earth.

THE GEOLOGICAL SOCIETY OF AMERICA®
CONNECTS 2023
15–18 October
Pittsburgh, Pennsylvania, USA

THANK YOU FOR MAKING CONNECTS 2023 A SUCCESS!

- **GSA 2023 Organizing Committee:** Gale Blackmer, General Co-Chair; Jessica Moore, General Co-Chair; Patrick Burkhart, Technical Program Chair; Kevin Mickus, Technical Program Vice-Chair; Brett McLaurin, Field Trip Chair
- **GSA 2023 Exhibitors, Sponsors, Mentors, Short Course Leaders, Field Trip Leaders**
- **2023 Joint Technical Program Committee**

GSA CONNECTS 2023 BY THE NUMBERS



Total Attendees: 4,463

45
Countries Represented

3,149
Abstracts Submitted

73
On To the Future Scholars

96
Mentors

THANK YOU TO ALL THE MENTORS WHO VOLUNTEERED THEIR TIME AT GSA CONNECTS 2023

Mentors are integral to GSA's meetings and are a source of motivation and support for students and early-career professionals as they seek advice and information related to their academic and career pathways. The following are programs where mentors volunteered, along with a comment from a mentee.

- On To the Future (OTF) Mentors
- GeoCareers Day Mentor Roundtables
- GeoCareers Day Panelists
- Early-Career Professional Coffee
- Résumé Clinic Mentors
- Drop-in Mentors
- Networking Reception Mentors
- Women in Geology Mentors
- GeoCareers Corner Presenters

"As an On To the Future grant recipient, I was able to interact, network, and build my community with so many people I may have not met otherwise. I felt welcomed, included, and heard. I felt like I belonged there presenting my research. Not to mention how supportive other academics were when walking up to my poster. It was an amazing conference." —Marykathryn Campos

Thank You 2023 Sponsors!*

Your support of GSA Connects 2023 continues a long-standing tradition of serving science and the profession. The Society appreciates your investment in the growth of current and future leaders in the geoscience community.

**as of 6 September 2023*

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Nominate a Deserving Colleague Today!

Recognize geoscientists who have made significant contributions in the field by honoring them with an award.

2024 GSA MEDALS AND AWARDS

Nomination deadline: 1 Feb. 2024

- **Penrose Medal**: Achievements that mark a major advance in the science of geology
- **Day Medal**: Outstanding distinction in the application of physics and chemistry to the solution of geologic problems
- **Honorary Fellow**: Distinguished contributions as an international geoscientist
- **Young Scientist Award (Donath Medal)**: Contributions to geologic knowledge through original research by a young scientist 35 years or younger
- **GSA Public Service Award**: Contributions that have materially enhanced the public's understanding of the earth sciences and the application of scientific and technical information to public affairs and earth science-related public policy
- **Randolph W. "Bill" and Cecile T. Bromery Award for Minorities**: Significant contributions to research in geological sciences by a member of an underrepresented group, who has been instrumental in opening the geoscience field to other minorities

Kelsey R. Moore, recipient of the 2023 Doris M. Curtis Outstanding Woman in Science Award.

- **GSA Distinguished Service Award**: Exceptional service to GSA
- **Doris M. Curtis Outstanding Woman in Science Award**: Major impact on the field of geosciences based on Ph.D research
- **Geologic Mapping Award in Honor of Florence Bascom**: Outstanding contributions in published high-quality geologic mapping

Karen Chin, 2023 Bromery Award Recipient, accepting the award at GSA Connects 2023. Watch an interview of Karen Chin and nominee Louis L. Jacobs discussing the importance of her nomination.

"People that work hard and honestly, pursue their craft and their goals, they deserve recognition."
—Louis Jacobs, nominator for 2023 Bromery Award

GSA International Distinguished Career Award

Nomination deadline: 1 March 2024

Awarded to an individual who advanced the international geological sciences through both scientific investigations and service.

James B. Thompson, Jr. Distinguished International Lecturer Award

Nomination deadline: 1 March 2024

Awarded to one non-North American scientist and one North American scientist to present stimulating and cutting-edge geoscience research.

Right: Cecilia M. McHugh, 2023 GSA International Distinguished Career Award Recipient.

AGI AWARDS

Nomination deadline: 1 Feb. 2024
Submit nominations for the following awards at www.agiweb.org/direct/awards.html.

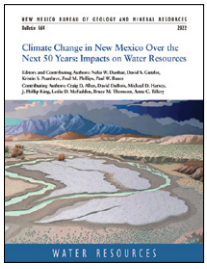
- **AGI Medal in Memory of Ian Campbell** for Superlative Service to the Geosciences recognizes singular performance in and contribution to the profession of geology. More information: https://www.americangeosciences.org/awards/iancampbell
- **AGI Marcus Milling Legendary Geoscientist Medal** is given to a recipient with consistent contributions of high-quality scientific achievements and service to the Earth sciences having lasting, historic value; who has been recognized for accomplishments in field(s) of expertise by professional societies, universities, or other organizations; and is a senior scientist nearing completion or has completed full-time regular employment.

Above: Vicki S. McConnell, The Geological Society of America Emerita, 2023 Ian Campbell Medal Recipient.

John C. Frye Environmental Geology Award

Nomination deadline: 31 March 2024

In cooperation with the Association of American State Geologists and supported by endowment income from the GSA Foundation's John C. Frye Memorial Fund, GSA makes an annual award for the best paper on environmental geology published either by GSA or by a state geological survey.



The 2023 awardee: New Mexico Geological Survey Bulletin 164 — *Climate Change in New Mexico Over the Next 50 Years: Impacts on Water Resources*, by Nelia W. Dunbar and editors & contributing authors.

Tim W. Wawrzyniec Fellowship at the Rocky Mountain Biological Laboratory

New proposal deadline: 1 Feb. 2024
Fellowship application deadline: 15 Feb. 2024

This fellowship is intended to support research conducted by PhD-holding investigators who have not previously worked through RMBL. This fund awards US$5,000 annually. To learn more, go to http://www.rmbl.org/scientists/ or contact gis@rmbl.org.

"I found immense satisfaction in nominating a worthy colleague for a GSA Award, as it highlighted the exceptional scientific creativity of an individual whom I deeply respect." —Kurt Konhauser, University of Alberta

"I see a nomination as a way of saying 'Yes, you deserve this.' It's a shout-out, 'we noticed,' and—most of all—'thank you' rolled into one." —Jeff Rubin

COLE RESEARCH GRANT AWARDS

Application deadline: 1 Feb. 2024
More information: www.geosociety.org/gsa/grants/postdoc.aspx

- The **Gladys W. Cole Memorial Research Award** for research on the geomorphology of semiarid and arid terrains in the United States and Mexico is awarded annually to a GSA member or Fellow between 30 and 65 years of age who has published one or more significant papers on geomorphology.
- The **W. Storrs Cole Memorial Research Award** for research on invertebrate micropaleontology is awarded annually to a GSA member or Fellow between 30 and 65 years of age who has published one or more significant papers on micropaleontology.

www.geosociety.org/nominate

For a list of other national awards and nomination forms, go to www.geosociety.org/national-awards.
If you know of an award not listed, please send details to awards@geosociety.org.

GSA Division Awards

CONTINENTAL SCIENTIFIC DRILLING DIVISION

Distinguished Lecturers

Nominations due 29 March

Submit nominations to the CSDD chair: Brett M. Carpenter, brett.carpenter@ou.edu

Three awardees will be outstanding scientists who, through a series of lectures at academic institutions, GSA events, and public events during the year of the award, highlight the outstanding discoveries and science undertaken through continental drilling.

community.geosociety.org/continentaldrilling/awards/award2

ENERGY GEOLOGY DIVISION

Gilbert H. Cady Award

Nominations due 1 March

Submit nominations to the Cady Award chair: Denise J Hills, denise.j.hills@gmail.com

The Gilbert H. Cady Award, first presented in 1973, recognizes outstanding contributions in the field of coal geology that advance the science both within and outside of North America.

community.geosociety.org/energydivision/awards/cady

Curtis-Hedberg Award

Nominations due 31 July

Submit nominations to the Curtis-Hedberg Award chair: Denise J Hills at denise.j.hills@gmail.com

The Curtis-Hedberg Award will be considered annually in accordance with the bylaws of the Society. The award will be made for outstanding contributions in the field of petroleum geology.

community.geosociety.org/energydivision/awards/curtishedberg

ENVIRONMENTAL AND ENGINEERING GEOLOGY DIVISION

E.B. Burwell Jr. Award

Nominations due 1 February

Submit nominations to the Burwell Award Selection Committee chair: Wendy Zhou, wzhou@mines.edu

The Edward Burwell Jr. Award, established by the Division in 1968, honors the memory of one of the founding members of the Division and the first chief geologist of the U.S. Army Corps of Engineers. This award is made to the author or authors of a published paper of distinction that advances knowledge concerning principles or practice of engineering geology, or of related fields of applied soil or rock mechanics where the role of geology is emphasized. The paper that receives the award must: (1) deal with engineering geology or a closely related field, and (2) have been published no more than five years prior to its selection. There are no restrictions on the publisher or publishing agency of the paper.

community.geosociety.org/eegdivision/awards/burwell

Distinguished Practice Award

Nominations due 31 March

Submit questions or nominations to the EEGD chair: Francis Kevin Rengers, frengers@usgs.gov

The Distinguished Practice Award recognizes outstanding individuals for their continuing contributions to the technical and/or professional stature of environmental and/or engineering geology. A nominee need not be a member of the EEGD, but must have made a major contribution to environmental and/or engineering geology in North America. Each nomination must be accompanied by a written citation.

community.geosociety.org/eegdivision/awards/new-item3

Richard H. Jahns Distinguished Lecturer

Nominations due 31 January

Email questions to Francis Kevin Rengers, frengers@usgs.gov. Submit nominations to manager@aegweb.org.

The Richard H. Jahns Distinguished Lectureship was established in 1988 by the Environmental & Engineering Geology Division and the Association of Environmental & Engineering Geologists to commemorate Jahns and to promote student awareness of engineering geology through an annual series of lectures at academic institutions. The award is given to an individual who, through research or practice, has made outstanding contributions to the advancement of environmental and/or engineering geology. The awardee will speak on topics such as earth processes and the consequences of human interaction with these processes, or the application of geology to environmental and/or engineering works. Award funds are administered by the GSA Foundation.

community.geosociety.org/eegdivision/awards/jahns

GEOARCHAEOLOGY DIVISION

Richard Hay Student Paper/Poster Award

Nominations due 31 August

Submit nominations to gsa.agd@gmail.com

At the 2006 Annual Meeting in Philadelphia, Pennsylvania, USA, the Division's management board elected to rename the student travel award for a distinguished scientist in archaeological geology. After consulting with his family, the award was officially named the Richard Hay Student Paper/Poster Award. Hay was a long-standing member of the Division and had a long and distinguished career in sedimentary geology, mineralogy, and archaeological geology. He is particularly well known for his work on the Olduvai Gorge and Laetoli Hominid-bearing sites and was awarded the Division's Rip Rapp Award in 2000. The Division is proud to have our student travel award bear his name.

The award is a travel grant for a student (undergraduate or graduate) presenting a paper or poster at GSA Connects. The grant is competitive and will be awarded based on evaluation of the scientific merit of the research topic and the clarity of an expanded abstract for the paper or poster prepared by a student for presentation in the Division's technical session at the meeting.

community.geosociety.org/geoarchdivision/awards/student/hay

Claude C. Albritton Jr. Award

Nominations due 15 April

Submit nominations to gsa.agd@gmail.com

Under the auspices of the Geoarchaeology Division, family, friends, and close associates of Claude C. Albritton Jr. have formed a memorial fund in his honor through the GSA Foundation. Initially, the fund was set up with a gift of several thousand dollars. Members of the Division, other GSA members, and those who know Albritton are being asked to consider contributing to this fund.

The Albritton Award Fund provides scholarships and fellowships for graduate students in the earth sciences or archaeology for research. Recipients of the award are students who have (1) an interest in achieving a master's or PhD degree in earth sciences or archaeology; (2) an interest in applying earth science methods to archaeological research; and (3) an interest in a career in teaching and academic research. Awards in the amount of US$650 are given in support of thesis or dissertation research, with emphasis on the field and/or laboratory aspects of the research.

community.geosociety.org/geoarchdivision/awards/student/albritton

Rip Rapp Award

Nominations due 15 February

Submit nominations to gsa.agd@gmail.com

In 1983, the Division established the "Archaeological Geology Division Award" for outstanding contributions to the interdisciplinary field of archaeological geology. In 1993, the award was officially renamed the "Rip Rapp Archaeological Geology Award" in honor of George "Rip" Rapp Jr. Rapp was one of the primary individuals responsible for establishment of the Division and generously established a Division award fund with the GSA Foundation. Donald L. Johnson was the first recipient of the renamed award. Nominations should include a biographical sketch, a statement of outstanding achievements, and a selected bibliography of the nominee.

community.geosociety.org/geoarchdivision/awards/riprapp

GEOBIOLOGY AND GEOMICROBIOLOGY DIVISION

Distinguished Career Award

Nomination due 1 March

Submit nominations here: https://forms.gle/4RMYccf8CCStzLFF7

The GSA Geobiology and Geomicrobiology Division recognizes three exceptional researchers to receive pre-tenure, post-tenure, and distinguished career awards (or equivalent career stage in a non-tenure track position) each year. The Geobiology and Geomicrobiology Division representatives request nominations from our members in order to ensure a diverse and inclusive nominee pool, both in terms of academic fields and demographics. We also hope this process allows our members to feel involved and empowered to nominate the people who have made a difference to them or their (sub)field. Final nominees will be selected by the GBGM division representation committee from amongst this pool, and awarded based on the nominee's complete portfolio (research, mentoring, service, and leadership).

community.geosociety.org/gbgm/awards/award1

GEOINFORMATICS AND DATA SCIENCE DIVISION

M. Lee Allison Award for Geoinformatics

Nominations due 28 February

Submit nominations here: https://forms.gle/xvj6T7gxzmRk2A3a7

The M. Lee Allison Award for Geoinformatics will be made to an individual who has contributed in an outstanding manner to geology through the application of the principles of geoinformatics. The individual will be a member of GSA. Normally, a single award will be made annually, but in any particular year may be withheld if the management board decides that no suitable candidate has been nominated.

community.geosociety.org/geoinformaticsdivision/awards

GEOLOGY AND HEALTH DIVISION

Distinguished Career Award

Nominations due 15 February

Submit nominations to Laura Ruhl-Whittle, lruhl.geo@gmail.com

The award recognizes the recipient's lifetime contributions to the field of Geology and Health. The awardee does not need to be a member of the Division.

community.geosociety.org/geologyhealthdivision/events32/upcoming-awards

GEOLOGY AND SOCIETY DIVISION

E-an Zen Fund for Geoscience Outreach Grant

Applications due 30 June

Submit nominations to the Division past chair: Lily Jackson, Lily.Jackson@uwyo.edu

This is a grant opportunity for Geology and Society Division members interested in developing innovative methods to bring geoscience knowledge to public audiences. Two grants of $1,500 each will be awarded to fund projects designed by the applicants to communicate geoscience information to a lay audience with the goal of increasing the understanding of geoscience and its impact on society among non-geoscientists and decision-makers. Applicants may apply as individuals or as groups, depending on the best fit for their project design. While the grant application requirements are intentionally broad to encourage creative thinking and innovation, review of applications will emphasize the potential for impacting communities that traditionally have not had significant exposure to the geosciences.

community.geosociety.org/gsocdivision/news/zenfund

GEOPHYSICS AND GEODYNAMICS DIVISION

George P. Woollard Award

Nominations due 1 February

Submit nominations to the Division chair: Ting Chen, tchen@lanl.gov

The George P. Woollard Award recognizes outstanding contributions to geology through the application of the principles and techniques of geophysics. A highlight of the presentation is the honorary George P. Woollard Technical Lecture by the recipient before the award ceremony. To submit a nomination, please provide the nominee's name, contact information, and a short paragraph stating the nominee's qualifications, including a short summary of their

specific work or outcomes and how these have contributed to geology. A curricula vitae, if available, helps, but is not required. Award funds are administered by the GSA Foundation.
community.geosociety.org/geophysicsdivision/awards/woollard

The Seth and Carol Stein Early Career Award in Geophysics and Geodynamics

Nominations due 1 February

Submit nominations to the Division chair: Ting Chen, tchen@lanl.gov

The Seth and Carol Stein Early Career Award in Geophysics and Geodynamics is in recognition of significant contributions to geology through the application of geophysics and geodynamics by a young scientist of outstanding ability. Nominated candidates must (1) be either no more than 35 years old or no more than six years beyond receiving a PhD or equivalent; (2) be a current GSA Geophysics and Geodynamics Division member in good standing and have been a Division member in the prior two years; and (3) have either a published or in-press paper in a GSA journal, or have presented a talk or poster at a GSA annual or section meeting. The primary nominator must also be a member of GSA's Geophysics and Geodynamics Division. The nominator should submit (1) the Division cover sheet (Word / PDF); (2) the candidate's CV; and (3) two or three letters of support, preferably in a single PDF.
community.geosociety.org/geophysicsdivision/awards/early-career-award-steins

GEOSCIENCE EDUCATION DIVISION

Biggs Award for Excellence in Earth Science Teaching

Nominations due 1 March

Submit nominations here: https://docs.google.com/forms/d/e/1FAIpQLSeODvAYeUICdqpsup-02TgWBgONGiubc4_jlxMNrp7A14Z2_Q/viewform?hl=en&pli=1

The Biggs Award recognizes innovative and effective teaching in college-level earth science. Earth science instructors and faculty members from any academic institution engaged in undergraduate education who have been teaching full-time for ten years or fewer are eligible (part-time teaching is not counted in this requirement). Both peer- and self-nominations will be accepted. This award, administered by the GSA Foundation, is made possible by support from the Donald and Carolyn Biggs Fund, the GSA Geoscience Education Division, and GSA's Center for Professional Excellence. An additional travel reimbursement is also available to the recipient to enable him or her to attend the award presentation at GSA Connects.
community.geosociety.org/gedivision/awards/biggsaward

HISTORY AND PHILOSOPHY OF GEOLOGY DIVISION

Mary C. Rabbitt History and Philosophy of Geology Award

Nominations due 15 February

Submit nominations to the Division secretary/treasurer: Christopher Hill, chill2@boisestate.edu

The Mary C. Rabbitt History and Philosophy of Geology Award is presented annually to an individual for exceptional scholarly contributions of fundamental importance to our understanding of the history of the geological sciences. Achievements deserving of the award include, but are not limited to, publication of papers or books that contribute new and profound insights into the history of geology based on original research or a synthesis of existing knowledge. The award was established by the History of Geology Division in 1981 and renamed in 2005 in memory of Mary C. Rabbitt, whose bequest has made this award possible. Neither the nominator nor the nominee need be a member of the Division or of GSA. The nomination packet should include (1) a letter detailing the contributions that warrant the award; and (2) the nominee's current curriculum vitae, including name, title, affiliation, education, degrees, honors and awards, major career events, and contributions that warrant the award. Monies for the award are administered by the GSA Foundation.
community.geosociety.org/histphildiv/awards/rabbitt

Gerald M. and Sue T. Friedman Distinguished Service Award

Nominations due 15 February

Submit nominations to the Division secretary/treasurer: Christopher Hill, chill2@boisestate.edu

The Gerald M. and Sue T. Friedman Distinguished Service Award, established in 2005, is presented for exceptional service to the advancement of our knowledge of the history and philosophy of the geological sciences. Neither the nominator nor the nominee need be a member of the Division or of GSA. The service to the history and philosophy of geology may include, but is not limited to, the discovery of and making available rare source materials; comprehensive bibliographic surveys; organizing meetings and symposia in the history and philosophy of geology; and exceptional service to the Division. The nomination packet should include (1) a letter detailing the contributions that warrant the award; and (2) the nominee's current curriculum vitae, including name, title, affiliation, education, degrees, honors and awards, major career events, and contributions that warrant the award. The award is made possible by a bequest from the estate of Mary C. Rabbitt. Monies for the award are administered by the GSA Foundation.
community.geosociety.org/histphildiv/awards/dsa

History and Philosophy of Geology Student Award

Nominations due 15 June

Submit nominations to the Division secretary/treasurer: Christopher Hill, chill2@boisestate.edu

The History and Philosophy of Geology Division provides a student award in the amount of US$1,000 for a paper to be given at GSA Connects. Awards may also be given for second place. Oral presentations are preferred. Faculty advisors may be listed as second author, but not as the lead author of the paper. The proposed paper may be (1) a paper in the history or philosophy of geology; (2) a literature review of ideas for a technical work or thesis/dissertation; or (3) some imaginative aspect of the history or philosophy of geology we have not thought of before. Students should submit an abstract of their proposed talk and a 1,500–2,000-word prospectus for consideration. Currently enrolled undergraduates and graduate students are eligible, as are students who received their degrees at the end of the fall or spring terms immediately preceding GSA Connects. The award is open to all students regardless of discipline, provided the proposed paper is related to the history or philosophy of a geological idea/person. The award is

made possible by a bequest from the estate of Mary C. Rabbitt. Monies for the award are administered by the GSA Foundation.
community.geosociety.org/histphildiv/awards/student

HYDROGEOLOGY DIVISION

O.E. Meinzer Award

Nominations due 1 February

Submit nominations to gsa.hydro.nominations@gmail.com

The O.E. Meinzer Award recognizes the author or authors of a publication or body of publications that have significantly advanced the science of hydrogeology or a closely related field. The nomination must cite the publication(s) on which the nomination is based and describe the role of the publication(s) in advancing hydrogeology or a closely related discipline. Inclusion of up to three additional third-party letters in support of the nomination is encouraged.
community.geosociety.org/hydrodivision/awards/meinzer

George Burke Maxey Distinguished Service Award

Nominations due 1 February

Submit nominations to gsa.hydro.nominations@gmail.com

The award will be made in recognition of distinguished personal service to the hydrogeology profession and to the Hydrogeology Division. The award is based on a history of sustained creditable service to the hydrogeology profession and to the Hydrogeology Division. Please submit a letter of nomination that describes the distinguished service that warrants the nomination. Supporting letters are helpful but not required.
community.geosociety.org/hydrodivision/awards/serviceaward

Kohout Early Career Award

Nominations due 1 February

Submit nominations to gsa.hydro.nominations@gmail.com

The award will be presented to a distinguished early career scientist (35 years of age or younger throughout the year in which the award is to be presented, or within five years of receiving their highest degree or diploma) for outstanding achievement in contributing to the hydrogeologic profession through original research and service, and for the demonstrated potential for continued excellence throughout their career. The nomination package must include at least one letter of nomination with a description of the significant contributions or accomplishments, a copy of the nominee's curriculum vitae with complete bibliography, and at least four supporting letters.
community.geosociety.org/hydrodivision/awards/kohout

Birdsall-Dreiss Distinguished Lecturer

Nominations due 1 February

Submit nominations to gsa.hydro.nominations@gmail.com

The lecturer shall be selected based on outstanding contributions to hydrogeology or a closely related field through original research and public communication, and the potential for continued contributions to the profession. The nomination package must include at least one letter of nomination, a copy of the nominee's curriculum vitae, and at least two supporting letters describing the significant contributions or accomplishments constituting the basis for the nomination.
community.geosociety.org/hydrodivision/birdsall/about2019

Schwartz Award for Excellence in Mentoring and Education

Nominations due 1 February

Submit nominations to gsa.hydro.nominations@gmail.com

The Schwartz Award for Excellence in Mentoring and Education will be considered annually in accordance with the bylaws of the Society. The award will be made to an individual (not multiple or group awardees) in recognition of distinguished personal service to the hydrogeology profession and to the Hydrogeology Division with respect to mentoring and education. The nomination must include a letter of nomination that describes the distinguished service in mentoring and education that warrants the nomination. Supporting letters are helpful but not required.
community.geosociety.org/hydrodivision/awards/schwartz2022

George Burke Maxey Distinguished Service Award

Nominations due 1 February

Submit nominations to gsa.hydro.nominations@gmail.com

The Hydrogeology Division's George Burke Maxey Distinguished Service Award, first presented in 1984, honors noted American hydrogeologist George Burke Maxey. An esteemed mentor and pioneering researcher, Maxey's career spanned more than 35 years and helped establish hydrogeology as the discipline we know today. Presented annually, the award recognizes exemplary service "to the hydrogeology profession and to the Hydrogeology Division." The award will be made in recognition of distinguished personal service to the hydrogeology profession and to the Hydrogeology Division. The award is based on a history of sustained creditable service to the hydrogeology profession and to the Hydrogeology Division. The recipient must be a member of the Hydrogeology Division and not have previously received the award. A letter of nomination that describes the distinguished service that warrants the nomination is required. Supporting letters are helpful but not required.
community.geosociety.org/hydrodivision/awards/serviceaward

KARST DIVISION

Karst Division Meritorious Contribution Award

Nominations due 31 March

Submit nominations to awards.gsakarst@gmail.com; cc the Division secretary: Daniel Jones, daniel.s.jones@nmt.edu

Awarded to the author of a published paper or body of work of distinction that has significantly influenced the intellectual direction of karst or broadly enhanced the knowledge of the discipline. If you are submitting a self-nomination, please include a letter of recommendation from a karst professional that can attest to your qualifications. Nominees do not need to be Karst Division members to be eligible for these awards, but it does add merit to the nomination.

Nominators are required to affirm the following statement on the award nomination form: "To my knowledge the person I am nominating has not breached GSA's Code of Ethics & Professional Conduct nor is this person under investigation for any action that would be a breach of GSA's Code of Ethics & Professional Conduct."

Karst Division Early Career Award

Nominations due 31 March

Submit nominations to awards.gsakarst@gmail.com; cc the Division secretary: Daniel Jones, daniel.s.jones@nmt.edu

Awarded to a distinguished scientist (35 or younger throughout the year in which the award is to be presented, or within five years of their highest degree or diploma) for outstanding achievement in contributing to the karst profession through original research and service, and for the demonstrated potential for continued excellence throughout their career. If you are submitting a self-nomination, please include a letter of recommendation from a karst professional that can attest to your qualifications. Nominees do not need to be Karst Division members to be eligible for these awards, but it does add merit to the nomination.

Nominators are required to affirm the following statement on the award nomination form: "To my knowledge the person I am nominating has not breached GSA's Code of Ethics & Professional Conduct nor is this person under investigation for any action that would be a breach of GSA's Code of Ethics & Professional Conduct."

Karst Division Distinguished Service Award

Nominations due 31 March

Submit nominations to awards.gsakarst@gmail.com; cc the Division secretary: Daniel Jones, daniel.s.jones@nmt.edu

Awarded to a highly esteemed scientist in recognition of distinguished personal service to the karst profession and to the Karst Division. If you are submitting a self-nomination, please include a letter of recommendation from a karst professional that can attest to your qualifications. Nominees do not need to be Karst Division members to be eligible for these awards, but it does add merit to the nomination.

Nominators are required to affirm the following statement on the award nomination form: "To my knowledge the person I am nominating has not breached GSA's Code of Ethics & Professional Conduct nor is this person under investigation for any action that would be a breach of GSA's Code of Ethics & Professional Conduct."

LIMNOGEOLOGY DIVISION

Israel C. Russell Award

Nominations due 1 February

Submit nominations to the Division treasurer: David Finkelstein, finkelstein@hws.edu

The Israel C. Russell Award is awarded for major achievements in limnogeology through contributions in research, teaching, and service. Nominations should consist of a letter describing the nominee's accomplishments in the field of limnogeology (broadly defined and including limnogeology, limnology, and paleolimnology), service to students and teaching, and contributions to GSA, as well as a curriculum vitae.

community.geosociety.org/limnogeologydivision/awards/russell

Kerry Kelts Research Award

Nominations due 1 February

Submit nominations to the Division chair: Jason Price, jasonrprice01@gmail.com

The Kerry Kelts Research Award is for undergraduate or graduate student research related to limnogeology, limnology, or paleolimnology.

community.geosociety.org/limnogeologydivision/awards/kerrykelts

MINERALOGY, GEOCHEMISTRY, PETROLOGY, AND VOLCANOLOGY (MGPV) DIVISION

MGPV Distinguished Geologic Career Award

Nominations due 31 March

Submit nominations to the Division secretary: J. Alex Speer, jaspeer@minsocam.org

The MGPV Distinguished Geologic Career Award will go to an individual who, throughout his/her career, has made distinguished contributions in one or more of the following fields of research: mineralogy, geochemistry, petrology, or volcanology, with emphasis on multidisciplinary, field-based contributions. Nominees need not be citizens or residents of the United States, and membership in the Geological Society of America is not required. The award will not be given posthumously.

community.geosociety.org/mgpvdivision/awards/dgca

MGPV Early Career Award

Nominations due 31 March

Submit nominations to the Division secretary: J. Alex Speer, jaspeer@minsocam.org

The MGPV Early Career Award will go to an individual near the beginning of his/her professional career who has made distinguished contributions in one or more of the following fields of research: mineralogy, geochemistry, petrology, or volcanology, with emphasis on multidisciplinary, field-based contributions. Nominations are restricted to those who are within eight years past the award of their final degree. Extensions of up to two years will be made for nominees who have taken career breaks for family reasons or caused by serious illness. Nominees need not be citizens or residents of the United States, and membership in the Geological Society of America is not a requirement. The award will not be given posthumously.

community.geosociety.org/mgpvdivision/awards/earlycareer

PLANETARY GEOLOGY DIVISION

G.K. Gilbert Award

Nominations due 15 January

Submit nominations to the Division past chair: Marisa Palucis, marisa.c.palucis@dartmouth.edu

The G.K. Gilbert Award will be considered annually in accordance with the bylaws of the Society. The award will be made for outstanding contributions to the solution of a fundamental problem(s) of planetary geology in its broadest sense, including planetary geology, geochemistry, mineralogy, petrology, tectonics, geophysics, and the field of meteoritics. Such contributions may consist either of a single outstanding publication, or a series of publications that have had great influence on the field. The award is named for G.K. Gilbert, who over one hundred years ago clearly recognized the importance of a planetary perspective in solving terrestrial geological problems.

community.geosociety.org/pgd/awards/gilbert

Eugene M. Shoemaker Impact Cratering Award

Nominations due 15 August

Submit nominations here: https://www.lpi.usra.edu/Awards/shoemaker/

The Eugene M. Shoemaker Impact Cratering Award is for undergraduate or graduate students, of any nationality, working in any country, in the disciplines of geology, geophysics, geochemistry, astronomy, or biology. The award, which will include US$2500, is to be applied to the study of impact craters, either on Earth or on the other solid bodies in the solar system. Areas of study may include, but shall not necessarily be limited to, impact cratering processes; the bodies (asteroidal or cometary) that make the impacts; or the geological, chemical, or biological results of impact cratering.
community.geosociety.org/pgd/awards/shoemaker

Pellas-Ryder Award

Nominations due 31 January

Submit nominations to Nicholas Lang, nlang@mercyhurst.edu

This award, which is jointly sponsored by the Meteoritical Society, is awarded to an undergraduate or graduate student who is first author of the best planetary science paper published in a peer-reviewed scientific journal during the year prior to the award. Potential topics are listed on the cover of *Meteoritics & Planetary Science*, and include asteroids, comets, craters, interplanetary dust, interstellar medium, lunar samples, meteors, meteorites, natural satellites, planets, tektites, and origin and history of the solar system. The award has been given since 2001 and honors the memories of meteoriticist Paul Pellas and lunar scientist Graham Ryder.
community.geosociety.org/pgd/awards/pellas-ryder

Ronald Greeley Award for Distinguished Service

Nominations due 15 August

Submit nominations to the Division chair: Marisa Palucis, marisa.c.palucis@dartmouth.edu

In 2011, the Planetary Geology Division (PGD) established the Ronald Greeley Award for Distinguished Service. This award may be given to those members of the PGD, and those outside of the Division and GSA, who have rendered exceptional service to the PGD for a multi-year period. The award is not open to currently serving members of the management board but may be awarded to past members of the management board who have provided exceptional service to the PGD after their term on the management board has ended. Nominations for the award, which should include a description of what the nominee has given to the PGD community, may be made by any PGD member to the management board.
community.geosociety.org/pgd/awards/greeley

Dwornik Award

Nominations due 10 January

Submit nominations here: https://higherlogicdownload.s3.amazonaws.com/GEOSOCIETY/cced1fdd-b74e-4b63-b36a-e8ae0ccf3c18/UploadedImages/dwornik2024-application-form.pdf

The Dwornik Award was started in 1991 with a generous endowment by Dr. Stephen E. Dwornik, who wished to encourage U.S. students to become involved with NASA and planetary science. The award consists of a plaque and a monetary award given for outstanding student presentations (in both poster and oral categories) or a plaque for honorable mentions (poster and oral) at the annual Lunar and Planetary Science Conference (LPSC) hosted by the Lunar and Planetary Institute [https://www.lpi.usra.edu/]. The awards are managed and judged by the Planetary Geology Division.
community.geosociety.org/pgd/awards/dwornik

QUATERNARY GEOLOGY AND GEOMORPHOLOGY DIVISION

Farouk El-Baz Award for Desert Research

Nominations due 1 April

Submit nominations to the Division first vice chair: Jennifer L. Pierce, jenpierce@boisestate.edu. Please submit electronically unless hardcopy previously approved.

The Farouk El-Baz Award for Desert Research rewards excellence in desert geomorphology research worldwide. It is intended to stimulate research in desert environments by recognizing an individual whose research has significantly advanced the understanding of the Quaternary geology and geomorphology of deserts. Although the award primarily recognizes achievement in desert research, the funds that accompany it may be used for further research. The award is normally given to one person but may be shared by two people if the recognized research was the result of a coequal partnership. Any scientist from any country may be nominated. Because the award recognizes research excellence, self-nomination is not permitted. Neither nominators nor nominees need be GSA members. Nominations must include (1) a statement of the significance of the nominee's research; (2) a curriculum vitae; (3) letters of support; and (4) copies of no more than five of the nominee's most significant publications related to desert research. Monies for the award are derived from the annual interest income of the Farouk El-Baz Fund, administered by the GSA Foundation.
community.geosociety.org/qggdivision/awards/el-baz

Distinguished Career Award

Nominations due 1 April

Submit nominations to the Division secretary: Lisa Ely, ely@geology.cwu.edu. Please submit electronically unless hardcopy previously approved.

The Distinguished Career Award is presented annually to a Quaternary geologist or geomorphologist who has demonstrated excellence in their contributions to science. Because the award recognizes research excellence, self-nomination is not permitted. Neither nominators nor nominees need be GSA members.

Nominations must include (1) a brief biographical sketch; (2) a statement of no more than 200 words describing the candidate's scientific contributions to Quaternary geology and geomorphology; (3) a selected bibliography of no more than 20 titles; and (4) a minimum of four letters from colleagues supporting the nomination.
community.geosociety.org/qggdivision/awards/distinguished-career

Kirk Bryan Award for Research Excellence

Nominations due 1 February

Submit nominations to the Division secretary: Lisa Ely, ely@geology.cwu.edu. Please submit electronically unless hardcopy previously approved.

The Kirk Bryan Award for Research Excellence is bestowed upon the author or authors of a published paper of distinction advancing the science of geomorphology or some related field, such as Quaternary geology. The paper constituting the basis of

the award must fulfill the following requirements: (1) the paper will deal with geomorphology or with a bordering field; and (2) the paper will have been published not more than five years prior to its selection for the award. Nominations must include (1) a letter (1–3 pages long) by the chief nominator outlining the significance and importance of the nominated publication; (2) a copy of the publication; (3) reviews of the publications that have appeared in journals, newsletters, or books (if any); and (4) one or more letters from other supporters of the nomination.
community.geosociety.org/qggdivision/awards/kirkbryanaward

SEDIMENTARY GEOLOGY DIVISION

Laurence L. Sloss Award for Sedimentary Geology

Nominations due 15 February

Submit nominations to the Division secretary: Joel Saylor, jsaylor@eoas.ubc.ca

The Laurence L. Sloss Award for Sedimentary Geology is given annually to a sedimentary geologist whose lifetime achievements best exemplify those of Larry Sloss—i.e., achievements that contribute widely to the field of sedimentary geology and service to GSA. Submit (1) a cover letter describing the nominee's accomplishments in sedimentary geology and contributions to GSA; (2) a curriculum vitae; and (3) any additional supporting letters electronically. Nomination materials remain active for three years. Monies for the award are derived from the annual interest income of the Laurence L. Sloss Award for Sedimentary Geology Fund, administered by the GSA Foundation.
community.geosociety.org/sedimentarygeologydiv/awards/sloss

STRUCTURAL GEOLOGY AND TECTONICS DIVISION

Career Contribution Award

Nominations due 1 March

Submit nominations to the Division chair: Colin Amos, Colin.Amos@wwu.edu

This award is for an individual who throughout his/her career has made numerous distinguished contributions that have clearly advanced the science of structural geology or tectonics. Nominees need not be citizens or residents of the United States, and membership in the Geological Society of America is not required. Nominations should include (1) the name of the nominee, present institutional affiliation, and address; (2) a summary statement of nominee's major career contributions to the science of structural geology and tectonics; (3) selected key published works of the nominee; and (4) the name and address of nominator.
community.geosociety.org/sgt/awards/careercontribution

Sedimentary Geology Division and Structural Geology and Tectonics Division Joint Award: Stephen E. Laubach Structural Diagenesis Research Award

Nominations due 1 April

Submit nominations here: https://community.geosociety.org/sgt/awards/laubachaward

The Stephen E. Laubach Structural Diagenesis Research Award Fund promotes research combining structural geology and diagenesis and curriculum development in structural diagenesis. This award addresses the rapidly growing recognition that fracturing, cement precipitation and dissolution, evolving rock mechanical properties, and other structural diagenetic processes can govern recovery of resources and sequestration of material in deeply buried, diagenetically altered and fractured sedimentary rocks. The award highlights the growing need to break down disciplinary boundaries between structural geology and sedimentary petrology, exemplified by the work of Dr. Stephen Laubach and colleagues. The award alternates between being awarded by the Sedimentary Geology Division on odd numbered years, and the Structural Geology and Tectonics Division on even-numbered years, reflecting the focus of the award on this cycle. Graduate students, postgraduate, and faculty-level researchers are eligible.
community.geosociety.org/sgt/awards/laubachaward

Outstanding Publication Award

Nominations due 1 March

Submit nominations to the Committee chair: Alexis Ault, alexis.ault@usu.edu

This award is given annually for a published work (paper, book, or map) of exceptional distinction that clearly advances the science of structural geology or tectonics. Nominations should include (1) a full citation; (2) nomination (as short as a paragraph; letters or reviews may also be included); and (3) the name and address of the nominator.
community.geosociety.org/sgt/awards/outstandingpublication

Updated Position Statements

At GSA Connects 2023, GSA Council approved minor revisions to two position statements: "Managing U.S. Coastal Hazards" and "Diversity in the Geosciences."

"Managing U.S. Coastal Hazards" Position Summary: Storms, tsunamis, and rising sea levels threaten U.S. coastal communities and their economies. Much of the nation's existing coastal infrastructure must be adapted to expected future conditions or relocated. New coastal development and post-storm reconstruction should be planned, sited, and maintained with coastal geologic hazards clearly in mind.

This position statement provides a communications tool that (1) summarizes the main geologic hazards along the marine coasts of the United States—Atlantic, Gulf of Mexico, Pacific, and Arctic—and (2) urges scientists and policymakers to collaborate toward integrating geoscience information into policy and management actions in order to reduce the nation's current and future vulnerability to these hazards.

"Diversity in the Geosciences" Position Summary: The Geological Society of America (GSA) is committed to constructing an environment in which all can thrive by building an inclusive, equitable, and accessible professional community that engages diverse students, professional and academic geoscientists, and the communities they serve.

This position statement lays out actions that GSA is undertaking and recommending to institutions and geoscientists to support increased diversity in the geoscience community through cultural change, including (1) Focus on diversity-driven demographic data collection, measurement, and reporting; (2) Prioritize diversity in leadership and decision making; (3) Focus on systemic change; (4) Engage, empower, and hold accountable the geoscience community.

Full versions of all position statements are available online at **www.geosociety.org/positionstatements.** GSA members are encouraged to use the statements as geoscience communication tools when interacting with policymakers, students, colleagues, and the general public.

Hurricane Irma, Miami, Florida, USA. Photo credit: Warren Faidley / The Image Bank via Getty Images.

Figure 1. Mount Monadnock rises 600 m above the rolling plains at its base. Photo credit: Jonwmcinenrey via Wikimedia Commons. https://creativecommons.org/licenses/by-sa/3.0/deed.en.

Mount Monadnock: A Geologic Type Locality

Lon Abbott,* *Department of Geological Sciences, University of Colorado, Boulder, Colorado 80309, USA;* ***Terri Cook,*** *Down to Earth Science, LLC, Boulder, Colorado 90305, USA*

Among the entries for the letter "M" in the American Geological Institute's Dictionary of Geological Terms (Bates and Jackson, 1984), you will find:

> **monadnock** (mo-nad'-nock): A hill or mountain rising conspicuously above the general level of a peneplain in a temperate climate, representing an isolated remnant in a region that has been largely beveled to its base level.

Mount Monadnock, the type locality for this landform, stands a mere 965 m above sea level, but rises in splendid isolation 600 m above the rolling plains of southern New Hampshire (Fig. 1). The mountain is located 75 km west of Manchester and boasts an extensive trail system, making it a good day-trip destination that can be done in conjunction with GSA's 2024 Northeastern Section Meeting.

The influential Harvard geographer William Morris Davis introduced the term monadnock to the geologic literature in an 1896 *National Geographic* article describing the landscape of northeastern France (Davis, 1896). He used the name of the prominent mountain near his Massachusetts home as the appellation for all similarly prominent peaks that rise from comparatively flat plains. Davis was hardly the first person to take special note of Mount Monadnock's prominence amidst flat surroundings; its name comes from the Indigenous Abenaki language and is thought to translate as "the mountain that stands alone" (Anderson, 2022).

Davis was one of several American geologists, including John Wesley Powell, Clarence Dutton, and Grove Karl (G.K.) Gilbert, who pioneered the new discipline of geomorphology during the second half of the nineteenth century. The idea of a monadnock was part of Davis's conceptualization of a geomorphic cycle in which a landscape is uplifted and subsequently eroded to its base level, going through stages of youth, maturity, and old age. In old age the landscape is reduced to a peneplain, a gently rolling plain near base level (typically sea level). But Davis noted that places composed of especially resistant rock would erode more slowly than average, causing them to stand above the peneplain as a monadnock. He made no attempt to quantify the relative resistance between the rocks of the monadnock and those of the surrounding peneplain to gauge how long one of his hypothesized cycles lasts, commenting in one essay that he "has given no particular attention to the composition of the monadnock rocks" because one can simply "infer their greater resistance on account of their form" (Davis and Johnson, 1909). Davis's ideas formed the foundation of the discipline of geomorphology until the middle of the twentieth century, but his influence has since waned as the discipline gravitated back to the more quantitative and process-oriented approach of his contemporaries Gilbert and Dutton.

MONADNOCK'S RESISTANT ROCKS

New Hampshire's Mount Monadnock consists entirely of the Littleton Formation, a 5200-m-thick pile of Early Devonian marine sandstone/mudstone that was later metamorphosed into an alternating sequence of quartzites and mica schists (Fowler-Billings, 1949). When it was deposited, the coastline of Laurentia, the nucleus of today's North America, was located near the Vermont–New Hampshire border, and the great sediment pile that would later become the Littleton Formation was accumulating far to the east (in modern coordinates), offshore of a microcontinent called Avalonia.

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https://doi.org/10.1130/GSATG113GH.1

As the oceanic lithosphere that was attached to Laurentia subducted beneath Avalonia, it brought the microcontinent ever closer to Laurentia. This subduction progressively narrowed the western Iapetus Sea, which separated the continent and the microcontinent until, by the Middle Devonian, it was entirely consumed. During the ensuing collision, this pile of sand and mud was buried to a depth of 12 km, where the sandstone was metamorphosed to quartzite and the mudstone to a garnet-sillimanite schist (a mineral assemblage that records high pressure metamorphism; N. Davis, 2019). Abundant, lath-like pseudomorphs of sillimanite up to 7.6 cm long cover some rock exposures. Because the sillimanite resists erosion better than the surrounding rock, these laths stand out in stark relief, leading to their "turkey tracks" nickname (Fowler-Billings, 1949).

The Littleton Formation was intensely folded during the Laurentia-Avalonia collision, which is known as the Acadian Orogeny. Mount Monadnock lies near the axis of a major syncline, and the mountain's rocks host numerous smaller-scale folds. One especially photogenic isoclinal fold (Fig. 2), 5.5 m tall and 9 m long, lies just west of the summit and can be accessed from the Smith Summit or White Arrow trails. It is known as the "Billings Fold" because it gained geologic notoriety as the cover image of the 1942 edition of Marland Billings' well-known *Structural Geology* textbook (Thompson, 2013).

Figure 2. The Billings fold lies just below the summit. Photo credit: EdwardEMeyer via Wikimedia Commons. https://creativecommons.org/licenses/by-sa/4.0/deed.en.

During the orogeny's late stages, in the Late Devonian, voluminous granites and a few mafic dikes intruded across New Hampshire. The granites erode more rapidly than the Littleton Formation, so they are the dominant rock type in the lowlands surrounding the mountain. Only a few small dikes and sills cut through the Littleton Formation on Mount Monadnock (Thompson, 1988). These granites were extensively quarried throughout the state, with quarrying reaching a zenith between 1850 and 1900, when New Hampshire supplied millions of dollars' worth of granite building stone across New England (Fowler-Billings, 1949), earning it the nickname of the Granite State. The first quarry near Mount Monadnock was opened in 1812, and many more followed; several are now filled with water, forming scenic ponds. You can walk or bike past several abandoned quarries on the Cheshire rail trail, one of many trails that has been created from old railroad right of ways. It passes 4 km west of Mount Monadnock on its way between the towns of Fitzwilliam and Keene.

MAKING A MONADNOCK

The Acadian Orogeny marked the closing of the western Iapetus Ocean between Laurentia and Avalonia. This was followed by the Alleghenian Orogeny, which occurred when the eastern Iapetus Sea closed during the Carboniferous, triggering continent–continent collision between Laurentia and Gondwana. This collision completed the assembly of Pangaea. The Pangaean supercontinent then began to break apart during the Triassic, with North Africa separating from New England. Part of the old Avalonia microcontinent was left attached to New Hampshire and today forms much of Massachusetts (Davis, 2019). Several fault zones in the Monadnock area that were formed during these tectonic episodes provided conduits for silica-charged fluids, which precipitated as 100-m-wide silicified zones near Sip Pond, located just south of the mountain (Fowler-Billings, 1949).

Pangaea's breakup was the last major tectonic episode to affect the Mount Monadnock region; erosion has been the dominant geologic process for the last 200 million years. That prolonged period of erosion reduced the former mountains to today's gently undulating peneplain, leaving several resistant monadnocks, including Mount Monadnock, rising from it.

The mountain has a steep, craggy south flank, and a smoother, gentler north flank whose rocks display parallel striations. This shape is a legacy of one last, important geologic episode—Pleistocene glaciation. When the last Laurentide ice sheet moved south out of Canada during the Wisconsin glacial episode, about 75–15 ka, it completely covered Mount Monadnock. That burial by ice sculpted the mountain into an especially large roche moutonnée. The flow of ice over the summit smoothed and polished the mountain's northern (up-ice) flank and left glacial striations trending S20°E, the direction of ice flow (Fowler-Billings, 1949). The pressure shadow that formed on the south (lee) side of the mountain triggered freeze-thaw cycles that quarried large blocks, resulting in the craggy nature of the south face. When the glacier melted it dropped many such plucked blocks all around the mountain. Some of these exotic blocks were transported hundreds of kilometers from where they were plucked from the bedrock, so they are called glacial erratics. The most famous erratic in the area is a large, rectangular boulder called the Sarcophagus that stands at about 850 m elevation on the scenic Pumpelly Ridge trail, which ascends the mountain's east flank (Fowler-Billings, 1949).

A VIEW FOR THE AGES

Thanks to Mount Monadnock's eye-catching prominence and proximity to major population centers, it is climbed by more than 125,000 people each year, making it one of the most-climbed mountains in the world (Anderson, 2022). More than a dozen different trails ascend the mountain from every direction, with the Pumpelly Ridge trail considered the easiest thanks to its gentler gradient. The southern trails are short and steep, thanks to the glacial plucking on the mountain's lee side, with the White Dot trail climbing 600 m in less than 2.5 km.

On a clear day, the view from the top is stunning, encompassing several states and the Atlantic Ocean. Few New England mountains of comparable stature offer such expansive views because most are covered in forest. Monadnock's distant views are a prod-

uct of massive nineteenth-century fires that burned the forest and sterilized the ground. Henry David Thoreau, who visited the mountain four times between 1844 and 1860, recorded in his journal the story that settlers lit a fire in 1800 to drive away wolves but it raged out of control and burned to the summit. Although one might imagine that Thoreau, who usually delighted in making careful biological observations, would decry this forest destruction, he instead extolled the geologic value of Monadnock's bald top, remarking enthusiastically in his journal, "but what a study for rocks does this mountaintop afford!" (Thompson, 2013).

The extensive rock outcrops exposed by the fires make Mount Monadnock an especially good place to examine the area's abundant evidence of glacial sculpting. Thoreau repeatedly described features like striations and erratics, but his journal entries don't identify their glacial origin. That is somewhat surprising given that he was familiar with Louis Agassiz's glacial hypothesis for such landscape features. The likely explanation for this omission is that the glacial hypothesis was controversial at that time, with many geologists still favoring the flooding (diluvial) hypothesis for the presence of such features in New England. Another nineteenth-century luminary, Ralph Waldo Emerson, who visited Mount Monadnock in 1866, was clearly already convinced of the role glaciers had played in sculpting the New England landscape, noting the "uniform presence on the upper surface of the glacial lines or scratches, all in one self-same direction" (Thompson, 2013).

Ascents of Mount Monadnock were already popular in Thoreau's time, and he lamented the "newspaper and eggshell" debris left by the visitors. Climbers in the 1800s also enjoyed chiseling their names into the rock at the summit. Although Thoreau disapproved of the practice, he seemed not to be overly worried about it, predicting that the "bog and lichen" would soon claim the graffiti (Thompson, 2013). Fortunately, the mountain is now the protected centerpiece of Monadnock State Park, where such vandalism is forbidden.

If you are in New Hampshire to attend GSA's 2024 Northeastern Section Meeting, consider joining the longstanding tradition of summiting this iconic peak. There you can sign the summit register, revel in the expansive view, and peruse isoclinal folds and glacial striations from atop this landform type locality.

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The Inside Scoop: Tips for Funding and Career Success

Whether you're employed in academia or industry, your ability to secure external funding can be transformative, not only for advancing your research but also for the overall success of your organization or institution. For those working in the United States, the federal government is one of the best sources of such funding.

In the past year, various government agencies, including the U.S. Department of Energy (DOE), the National Science Foundation (NSF), the National Institutes of Health (NIH), and the National Oceanographic and Atmospheric Administration (NOAA), have allocated significant financial resources, amounting to billions of dollars, for areas related to geosciences. These encompass critical topics such as clean and renewable energy, critical minerals, weather prediction, and enhancing community resilience against the backdrop of climate and environmental changes and their effects on human health. Geoscientists are encouraged to utilize these funding opportunities.

This new section, the first installment in a forthcoming series of op-eds in *GSA Today*, is dedicated to sharing insights for securing federal funding, in addition to offering career tips that will help you succeed as an innovator in the geosciences.

It doesn't matter what field you're in—whether it's geoscience or not, and regardless of whether you work in academia, the private sector, or government, funding is essential to turn your ideas into reality. The question is: How can you secure the necessary funds? Given the increase in government funding for geoscience-related initiatives, it's a great time to explore how best to apply for grants and opportunities.

A key to success when seeking funding from federal agencies is establishing a meaningful connection with the individuals responsible for managing the programs you're interested in. Why is this so important? These program managers are the decision-makers or have direct access to those who are. They possess insights into the rationale behind funding decisions, understand the intricacies of the program, and hold the keys to unlocking the financial support you need.

The challenge many people, especially newcomers, face is how to identify the right person to contact. The process of pinpointing the appropriate contact may vary depending on the agency or organization. To help you navigate this challenge, here are some valuable tips:

1. Go to the **organization/agency website** and see if they have a list of staff members and their associated programs. For federal agencies you can usually (but not always) **find names and contact information.**
2. If you're checking out a specific funding opportunity, **read the solicitation** (or call for proposals) carefully. Many times there will be an **individual listed** as a **point of contact.** Reach out to that person–if they can't answer your question, they often will know who can.
3. The National Science Foundation funds the vast majority of nonmedical federally funded basic research in the U.S. and has an internal search engine called **"NSF Award Search"** [https://www.nsf.gov/awardsearch/]. For established programs or solicitations that have been running for a year or more, it's easy to **search by keyword** to find all the awards in that program or under that solicitation. Click on the proposal number of an award with a relevant title and the proposal abstract will pull up. In the abstract you will find the NSF program officer who created the award and their contact information. If you want more general information, such as who to call at DOE, simply search the web for "staff of DOE basic science programs" and a list of all science competition programs, the program officers, and their contact information will come up. You can do something similar for NIH or its environmental health division.

It's worth noting that individuals overseeing competitive proposal processes, especially those responsible for allocating funds, are often quite busy and might not always be easily accessible. However, it's essential to remember that if they are government employees, a significant part of their job is to serve the public—in essence, you. In order to best utilize the limited time program officers have available, be sure to thoroughly research their program and the specific proposal they manage before you reach out for assistance or guidance. You should have a clear idea of what the agency or organization is asking for and address it directly.

This is a great starting point when it comes to identifying the key decision-makers in the funding application process. It provides you with insights on whom to target, but there's more to the equation. What you might not realize is that highly successful individuals who consistently secure funding from various agencies take an additional strategic step—they actively cultivate relationships with their program officers, and you should do the same!

What does this mean in practice? Successful people make it a point to meet up with and talk to their program officers, or those responsible for programs of interest. Program officers are genuinely interested in having informal conversations with early career professionals with innovative or daring concepts, and there are plenty of opportunities to connect at national meetings, community workshops, or any event where agency representatives gather to gauge community interests and ideas.

Before you attend the next GSA meeting or industry conference, reach out (ideally about two to three weeks prior) to ask whether the person you'd like to connect with will be attending. If they are, express your interest in having a brief chat or setting up some one-on-one time with them. More often than not, they'll say "yes." After all, one of the primary reasons they attend events is to talk to their constituents, get a pulse on current developments in the field, and discover individuals pursuing intriguing projects. These meetings are the perfect place to ask questions about the program's priorities, find out what makes a proposal competitive, and gain insights into the review process.

Visit the GEO Innovation Hub [https://www.nsf.gov/geo/geo-innovation/] for more GEO-relevant resources and tools and discover how federal agencies can help you take your research to the next level.

SECOND ANNOUNCEMENT AND FINAL CALL FOR PAPERS

Joint Meeting: North-Central and South-Central Sections

58th Annual Meeting of the North-Central Section, GSA
58th Annual Meeting of the South-Central Section, GSA

Springfield, Missouri, USA
21–23 Apr. 2024

https://www.geosociety.org/nc-mtg

Photo credit: Springfield CVB.

The Mid-Continent Meeting!

We are excited to have the opportunity to host the joint meeting of the North-Central and South-Central Sections. We have built a diverse technical program that spans the geology of the Ozarks (Paleozoic units and abundant karst), to Precambrian basement outcrops both east and west of the Ozarks, to the structural features of the southern margin! This geology includes world-class lead-zinc deposits, paleontological finds, and fascinating environmental challenges. Beyond the rocks, we also invite you to join us as we explore recent changes in our profession and their implications for the educational preparation of the next generation of earth scientists. The program has many opportunities for students—our greatest resource for the future—to develop and build their career paths. We look forward to seeing you at the joint meeting!

LOCATION

The meeting will be held in Springfield, Missouri, USA. Situated near the heart of the Ozarks physiographic province, Springfield is a midsize town that provides a great launching point to examine mid-continent geology. The Oasis Hotel and Convention Center offers quality meeting rooms along with many relaxing places to sit and connect with your colleagues and continue discussions of geo-topics. Conveniently located near I-44 and US-65, the hotel is only steps away from historic US Route 66, and features in-house and nearby restaurants and an indoor pool with a relaxing tropical pool-side lounge. Take a field trip to see interesting geology from Paleozoic sedimentary systems to the Precambrian crystalline basement; view interactions between geology, society and historical development; or just enjoy one of Missouri's 7000+ caves. We invite you to join us at Springfield 2024!

CALL FOR PAPERS

Abstracts deadline: 16 Jan. 2024
Submit online at: **https://www.geosociety.org/nc-mtg**
Abstract submission fee: GSA members: professionals US$30, students US$18; non-members: professionals US$60, students US$36. If you cannot submit an abstract online, please contact Heather Clark, hclark@geosociety.org.

North-Central Section Students: This year, the North-Central Section will only be able to judge poster presentations for awards in both the graduate and undergraduate categories. To be considered for one of these awards, you must mark "Poster" as your format choice when submitting your abstract.

South-Central Section Students: The South-Central (SC) Section will judge undergraduate and graduate student oral and poster presentations. Four awards will be given: Best Undergraduate Poster Presentation, Best Graduate Poster Presentation, Best Undergraduate Oral Presentation, and Best Graduate Oral Presentation. SC Section students can submit to any session.

REGISTRATION

Early registration deadline: 18 Mar. 2024
Cancellation deadline: 25 Mar. 2024

Registration opens in January. All registration fees are listed in US$. For further information, or if you need special accommodations, please contact one of the general co-chairs: Douglas Gouzie, Missouri State University, douglasgouzie@missouristate.edu, or Mohamed Aly, University of Arkansas, aly@uark.edu.

Member Type	Early		Standard	
	Full Mtg.	One Day	Full Mtg.	One Day
Professional Member	US$275	US$185	US$375	US$265
Professional Member 70+ & 30-year member	US$200	US$130	US$250	US$175
Professional Nonmember	US$355	US$245	US$395	US$275
Early Career Professional Member	US$200	US$140	US$275	US$225
Student Member	US$90	US$65	US$150	US$120
Student Nonmember	US$135	US$105	US$190	US$155
K-12 Professional	US$100	US$75	US$125	US$100
Guest or Spouse	US$75	n/a	US$90	n/a
Field Trip/Short Course Only	n/a	US$60	n/a	US$90

TECHNICAL PROGRAM

Theme Sessions

T1. **Environmental Geophysics Applications.** *Endorsed by GSA Geophysics and Geodynamics Division.* Jon Fields, U.S. Environmental Protection Agency, fields.jon@epa.gov; Todd Halihan, Oklahoma State University, todd.halihan@okstate.edu; Jordon Massey, Oklahoma State University, jordon.massey@okstate.edu.

T2. **Using Near-Surface Geophysics to Solve Geological Problems.** *Endorsed by GSA Geophysics and Geodynamics Division.* Kevin Mickus, Missouri State University, kevinmickus@missouristate.edu; Doro Kennedy, University of Toledo, doro@utoledo.edu.

T3. **Geophysical, Geochemical, and Geodynamical Investigations of the Mid-Continent.** *Endorsed by GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division.* Kevin Mickus, Missouri State University, kevinmickus@missouristate.edu.

T4. **Geological Applications of Potential Field Geophysics.** *Endorsed by GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division.* Luel Emishaw, Oklahoma State University, luel.emishaw@okstate.edu; Andrew Katumwehe, Midwestern State University, andrew.katumwehe@msutexas.edu; Zelalem Demissie, Wichita State University, zelalem.demissie@wichita.edu; Khumo Leseane, University of Cape Town, South Africa, khumoless@gmail.com; Kevin Mickus, Missouri State University, kevinmickus@missouristate.edu; Mohamed Abdelsalam, Oklahoma State University, mohamed.abdel_salam@okstate.edu.

T5. **Patterns, Drivers, and Implications of Natural and Induced Continental Intraplate Earthquakes.** *Endorsed by GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division.* Tandis Bidgoli, California State University–San Bernardino, tandis.bidgoli@csusb.edu; Daniel Sturmer, University of Cincinnati, sturmedm@ucmail.uc.edu.

T6. **Future Directions in Mineralogy and Petrology: A Session for Undergraduate and Graduate Researchers.** *Endorsed by GSA Mineralogy, Geochemistry, Petrology and Volcanology Division*. Gary Michelfelder, Missouri State University, garymichelfelder@missouristate.edu.

T7. **Ultramafic and Mafic Magmatism.** *Endorsed by GSA Mineralogy, Geochemistry, Petrology, and Volcanology Division.* Alison Graettinger, University of Missouri–Kansas City, graettingera@umkc.edu; Matthew Brueseke, Kansas State University, brueseke@ksu.edu.

T8. **Earth and Planetary Mineralogy and Chemistry.** *Endorsed by GSA Mineralogy, Geochemistry, Petrology, and Volcanology Division.* Neil Van Kanegan, University of Illinois Urbana–Champaign, niv2@illinois.edu.

T9. **Topics in Volcanology, Geochemistry, and Igneous/Metamorphic Petrology.** *Endorsed by GSA Mineralogy, Geochemistry, Petrology and Volcanology Division.* Gary S. Michelfelder, Missouri State University, garymichelfelder@missouristate.edu; Ethan Wagner, Missouri State University, ew976s@missouristate.edu.

T10. **Orogens and Aulacogens: Advances in the Study of Magmatism, Metamorphism, and Deformation.** *Endorsed by GSA Structural Geology and Tectonics Division; GSA Mineralogy, Geochemistry, Petrology, and Volcanology Division.* Liane Stevens, Stephen F. Austin State University, stevenslm@sfasu.edu; Jonathan Price, Midwestern State University, jonathan.price@msutexas.edu; Michael DeAngelis, University of Arkansas at Little Rock, mtdeangelis@ualr.edu.

T11. **Evolution of the Mississippian Margin of South-Central Laurentia.** *Endorsed by GSA Sedimentary Geology Division; GSA Structural Geology and Tectonics Division.* Kevin Ray Evans, Missouri State University, kevinevans@missouristate.edu; Todd L. Robitsch, Missouri State University, tlrkg0pn@gmail.com.

T12. **Appalachian & Ouachita-Marathon Orogenesis: Records of Late Paleozoic Supercontinent Assembly Along Southern and Eastern Laurentia.** *Endorsed by GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division.* Brandon Lutz, U.S. Geological Survey (USGS), blutz@usgs.gov; Tyson Smith, USGS, tmsmith@usgs.gov; Mark Hudson, USGS, mhudson@usgs.gov.

T13. **New Basement Perspectives on the Precambrian Evolution of North America.** *Endorsed by GSA Geophysics and Geodynamics Division; GSA Structural Geology and Tectonics Division.* Gregory Dumond, University of Arkansas, gdumond@uark.edu; Christopher Daniel, Bucknell University, cdaniel@bucknell.edu; Ruth Aronoff, Furman University, ruth.aronoff@furman.edu.

T14. **New Insights into the Tectonic Evolution and Deformation of the Ozark Plateau of the Mid-Continent Region.** *Endorsed by GSA Structural Geology and Tectonics Division.* Melina Lazar, Oklahoma State University, melina.lazar@okstate.edu; Daniel Lao Davila, Oklahoma State University, daniel.lao_davila@okstate.edu.

T15. **Carbonate-Hosted Base Metal Deposits of the U.S. Mid-Continent: Genesis, Exploitation, and Remediation.** *Endorsed by Society of Economic Geologists.* Aaron W. Johnson, The American Institute of Professional Geologists, awj@aipg.org.

T16. **Advances in Understanding Critical Mineral Deposits.** *Endorsed by Society of Economic Geologists.* Martin Appold, University of Missouri–Columbia, appoldm@missouri.edu; Hector Lamadrid, University of Missouri–Columbia, lamadridh@missouri.edu.

T17. **Critical Mineral Studies in the Mid-Continent United States.** *Endorsed by Society of Economic Geologists.* Cheryl Seeger, Missouri Geological Survey, cheryl.seeger@dnr.mo.gov; Kyle Ganz, Missouri Geological Survey, kyle.ganz@dnr.mo.gov; Nick Umholtz, Missouri Geological Survey, nick.umholtz@dnr.mo.gov.

T18. **Undergraduate Research Poster Session (Posters).** *Endorsed by Council on Undergraduate Research Geosciences Division.* Robert Shuster, University of Nebraska–Omaha, rshuster@unomaha.edu; Jeffrey Strasser, Augustana College, jeffreystrasser@augustana.edu.

T19. **Undergraduate and Graduate Geoscience Student Showcase (Posters).** *Endorsed by Council on Undergraduate Research Geosciences Division.* Claire McLeod, Miami University, mcleodcl@miamioh.edu; Ken Brown, DePauw University, kennethbrown@depauw.edu; Ginny Peterson, Grand Valley State University, petersvi@gvsu.edu; Robert Shuster, University of Nebraska–Omaha, rshuster@unomaha.edu.

T20. **Limestone Karsts of Asia and Other Regions: Imperiled Regions of Endemic Biodiversity.** *Endorsed by GSA Karst Division.* Peter A. Cohen, Universiti Sains Malaysia, petercohen@hotmail.com.

T21. **Urbanization in a Karst Terrane.** *Endorsed by GSA Karst Division.* Wendell Barner, Barner Consulting, LLC, wendell.barner@gmail.com; Douglas Gouzie, Missouri State University, douglasgouzie@missouristate.edu.

T22. **Agricultural Impacts on Hydrology and Water Quality in the Midwest.** *Endorsed by GSA Environmental and Engineering Geology Division.* Eric W. Peterson, Illinois State University, ewpeter@ilstu.edu.

T23. **Analysis of Long-Term Water-Level Changes in the Oklahoma Panhandle and Other Regions of the High Plains Aquifer.** *Endorsed by GSA Environmental and Engineering Geology Division.* Zachary Tomlinson, Oklahoma Water Resources Board, zachary.tomlinson@owrb.ok.gov; Derrick Wagner, Oklahoma Water Resources Board, derrick.wagner@owrb.ok.gov; Jessica Correll, Oklahoma Water Resources Board, jessica.correll@owrb.ok.gov; Chris Neel, Oklahoma Water Resources Board, chris.neel@owrb.ok.gov.

T24. **Recent Trends in Environmental Geology.** *Endorsed by GSA Environmental and Engineering Geology Division.* Melida Gutierrez, Missouri State University, mgutierrez@missouristate.edu.

T25. **General Topics in Geochemistry.** *Endorsed by GSA Environmental and Engineering Geology Division.* Tara Kneeshaw, Grand Valley State University, kneeshta@gvsu.edu; Melida Gutierrez, Missouri State University, mgutierrez@missouristate.edu.

T26. **Case Histories of Practicing Environmental and Engineering Geologist Investigations.** *Endorsed by GSA Environmental and Engineering Geology Division.* Bobbi Koepke, Environmental Works Inc., bkoepke@environmentalworks.com.

T27. **Professional Applied Geology: Case Studies and Practice.** *Endorsed by GSA Environmental and Engineering Geology Division.* Gregory L. Hempen, EcoBlast, LC, greg@ecoblst.com.

T28. **Pleistocene-Age Continental Deposits Beyond the Glacial Border.** Charles Rovey, Missouri State University, charlesrovey@missouristate.edu.

T29. **Recent Advances in Remote Sensing and GIScience and Their Applications in Geosciences.** Mohamed Aly, University of Arkansas, aly@uark.edu.

T30. **Emerging Voices in Paleontology.** *Endorsed by Paleontological Society.* Sarah Jacquet, University of Missouri, jacquets@missouri.edu; Jim Schiffbauer, University of Missouri, schiffbauerj@missouri.edu; John Huntley, University of Missouri, huntleyj@missouri.edu; Tara Selly, University of Missouri, sellyt@missouri.edu.

T31. **Echinoderm Paleobiology: Evolution, Ecology, and Earth History.** *Endorsed by Paleontological Society.* David F. Wright, Sam Noble Museum of Natural History, University of Oklahoma, wrightdf@ou.edu; Selina R. Cole, Sam Noble Museum of Natural History, University of Oklahoma, colesr@ou.edu; Elizabeth Petsios, Baylor University, elizabeth_petsios@baylor.edu; Anne Raymond, Texas A&M University, raymond@geo.tamu.edu.

T32. **Building the Pipeline: 4th Grade through Two-Year Colleges**. Melanie Carden-Jessen, Missouri State University, mcardinjessen@missouristate.edu.

T33. **The Role of Computers in Geoscience Research.** Heidi Krauss, Michigan State University, heidi.n.krauss@gmail.com; John Salako, Michigan State University, salakojo@msu.edu; Allison Pease, Michigan State University, peaseall@msu.edu.

T34. **Long-Term Impact on Student Learning from Classroom Disruptions Associated with Global Pandemics, School Shootings, or Academic Strikes in the Field of Geosciences.** Allison Pease, Michigan State University, peaseall@msu.edu; Andrea Saavedra, Michigan State University, saaved16@msu.edu; Heidi Krauss, Michigan State University, kraussh2@msu.edu.

T35. **Expanding Your Professional Capacity: Navigating Leadership, Communication, Mentoring, Work-Life Balance, and Mental Health.** Jennifer Nocerino, The Geological Society of America, jnocerino@geosociety.org.

T36. **New Insights on the Wichita Mountains: A Failed Aulacogen?** James H. Knapp, Oklahoma State University, james.knapp@okstate.edu; Brandon Spencer, Oklahoma State University, spbr@okstate.edu.

FIELD TRIPS

Trip registration opens in January. For additional information, please contact the field trip co-chairs: Charles Rovey, charlesrovey@missouristate.edu, and Matthew McKay, matthewmckay@missouristate.edu.

Ordovician and Mississippian Stratigraphy in Southwestern Missouri. Sat., 20 April. US$TBP. Charles Rovey, Missouri State University, charlesrovey@missouristate.edu; Damon Bassett, Missouri State University, dbassett@missouristate.edu.

Urbanization in a Karst Terrane. Sat., 20 April. US$TBP. Wendell Barner, Barner Consulting, LLC, Wendell.barner@gmail.com; Doug Gouzie, Missouri State University, douglasgouzie@missouristate.edu.

Phenix Rising: Restoration and Revitalization of a Major Dimension-Stone Manufacturer in Southwest Missouri. Wed., 24 April. US$TBP. Kevin Ray Evans, Missouri State University, kevinevans@missouristate.edu; Joe Hannibal, University of Akron and Cleveland Museum of Natural History, jhannibal@uakron.edu.

Spectacular Trace-Fossil Assemblages within the Northview Formation, SW Missouri. Sun., April 21. US$TBP. Charles Rovey, Missouri State University, charlesrovey@missouristate.edu; Damon Bassett, Missouri State University, dbassett@missouristate.edu.

The Burlington Formation, Route 66, and Cold Storage Warehousing. Sun., 21 April. US$TBP. Douglas Gouzie, Missouri State University, douglasgouzie@missouristate.edu; James McDaniel, Missouri State University, jim898s@missouristate.edu.

Petrology and Structure of the Mesoproterozoic Igneous Rocks of the St. Francois Mountains, Southeast Missouri. Fri., 19 April–Sat., 20 April. US$TBP. Gary Michelfelder, Missouri State University, garymichelfelder@missouristate.edu; Hanlin Zhang, Missouri State University, hz423s@missouristate.edu.

Geology of the Ouachita Mountains and Linkages to North American Late Paleozoic Orogenesis. Fri., 19 April–Sat., 20 April. US$TBP. Matthew McKay, Missouri State, matthewmckay@missouristate.edu; William Jackson, University of Memphis, wtjckson@memphis.edu.

The Geology and Genesis of the World-Class Pb-Zn-Cu Ores of the Viburnum (MO) Trend. Tues., 23 April–Wed., 24 April. US$TBP. Aaron W. Johnson, The American Institute of Professional Geologists, awj@aipg.org.

SHORT COURSES

Short course registration opens in January. For additional information, please contact the short course co-chairs: Melanie Carden-Jessen, Missouri State University, mcardinjessen@missouristate.edu, and Melida Gutierrez, Missouri State University, mgutierrez@missouristate.edu.

All short courses are US$15/person, unless otherwise noted. Does not include meals. All courses will take a break for lunch.

Introduction to Visualizing and Interpreting 3D Geologic Data Using X-Ray Tomographic Microscopy. Tara Selly, University of Missouri, sellyt@missouri.edu; Sarah Jacquet, University of Missouri, jacquets@missouri.edu; James Schiffbauer, University of Missouri, schiffbauerj@missouri.edu.

Applications of the Geochemical Code Visual Minteq to Medical Geology. Melida Gutierrez, Missouri State University, mgutierrez@missouristate.edu.

Getting Started with Drones and Structure from Motion Photogrammetry in Your Research and Teaching. Toby Dogwiler, Missouri State University, tdogwiler@missouristate.edu.

Using Project WET to Teach Earth and Environmental Science. US$45 (includes course material). Indigo Tran, Missouri State University/Missouri Project WET, indigotran@missouristate.edu; Melanie Carden-Jessen, Missouri State University, mcardenjessen@missouristate.edu.

ACCOMMODATIONS

Hotel registration deadline: 31 Mar. 2024, 5 p.m. CT

A block of rooms has been reserved at the Oasis Hotel (Ascend Collection, Choice Hotels), 2546 N. Glenstone Ave, Springfield, Missouri 65803, USA, located near I-44 and US-65. The meeting rate is US$114 per night plus tax (1–4 persons). The hotel offers many amenities (restaurants, bar, pool, Wi-Fi) and a complimentary shuttle to and from Springfield-Branson National Airport. Reservations can be made by calling +1-417-866-5253 or +1-888-532-4338. Please be sure to identify yourself as part of our meeting and ask for the "North-Central & South-Central Sections" group rate. Parking is available at the hotel and convention center (behind the hotel).

OPPORTUNITIES FOR STUDENTS AND EARLY CAREER PROFESSIONALS

Career Mentoring Luncheons

Ask your career-related questions and learn about nonacademic pathways in the geosciences while networking with professionals at the Roy J. Shlemon and John Mann Mentor Luncheons. GSA student members are welcome.

Career Workshop Series

This three-part series will feature career development planning, an exploration of geoscience job sectors, and information on best practices for crafting a résumé and cover letter. Non-technical skills and workforce statistics will be reviewed. The series will be led by workshop presenters and geoscientists. No registration is required and everyone is welcome.

Learn more at **www.geosociety.org/mentors.** Questions? Contact Jennifer Nocerino at jnocerino@geosociety.org.

Student Volunteers

Take advantage of work opportunities to earn free meeting registration. Students interested in helping with the various aspects of the meeting should contact Damon Bassett, Missouri State University, dbassett@missouristate.edu.

PROFESSIONALS

If you would like to share your interest, enthusiasm, and experience in applied geology, consider being a GSA mentor. Being a mentor is a rewarding experience. To learn more about serving as a mentor, contact Jennifer Nocerino at jnocerino@geosociety.org.

The joint meeting also offers an excellent opportunity to earn CEUs toward your continuing education requirements for your employer, K–12 school, or professional registration. The CEU certificate may be downloaded from the meeting website after the meeting.

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LOCAL COMMITTEE

General Co-Chairs: Douglas Gouzie, Missouri State University, douglasgouzie@missouristate.edu; Mohamed Aly, University of Arkansas, aly@uark.edu
Technical Program Chair: Kevin Mickus, Missouri State University, kevinmickus@missouristate.edu
Field Trip Co-Chairs: Charles Rovey, Missouri State University, charlesrovey@missouristate.edu; Matthew McKay, Missouri State University, matthewmckay@missouristate.edu
Short Course Co-Chairs: Melanie Carden-Jessen, Missouri State University, mcardinjessen@missouristate.edu; Melida Gutierrez, Missouri State University, mgutierrez@missouristate.edu
Exhibits Co-Chairs: Gary Michelfelder, Missouri State University, garymichelfelder@missouristate.edu; Adriana Potra, University of Arkansas, potra@uark.edu
Student Volunteer Co-Chairs: Damon Bassett, Missouri State University, dbassett@missouristate.edu; Gregory Dumond, University of Arkansas, gdumond@uark.edu
Judge Coordinator: Celina Suarez, casuarez@uark.edu
Welcome Party Chair: Nancy Williams, whimsicalwms@gmail.com
North-Central Section Secretary: Tandis Bidgoli, California State University–San Bernardino, tandis.bidgoli@csusb.edu
South-Central Section Secretary: Michael DeAngelis, University of Arkansas at Little Rock, mtdeangelis@ualr.edu

iStock.com/ William Reagan

Northeastern Section Meeting

Manchester, New Hampshire
17–19 March

www.geosociety.org/ne-mtg

Left: Beach near Portsmouth, New Hampshire.

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Joint Cordilleran/ Rocky Mountain Section Meeting

Spokane, Washington
15–17 May

www.geosociety.org/cd-mtg

Below: Spokane Falls. Photo credit: Chad Pritchard.

Southeastern Section Meeting

Asheville, North Carolina
15–16 April

www.geosociety.org/se-mtg

Above: Blue Ridge Mountains. Photo credit: Ashley Lynn.

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Joint North-Central/ South-Central Section Meeting

Springfield, Missouri
21–23 April

www.geosociety.org/nc-mtg

Right: Smallin Civil War Cave. Photo credit: Springfield CVB.

SECOND ANNOUNCEMENT AND FINAL CALL FOR PAPERS

Southeastern Section

73rd Annual Meeting of the Southeastern Section, USA

Asheville, North Carolina, USA
15–16 Apr. 2024

www.geosociety.org/se-mtg

Photo credit: Ashley Lynn.

LOCATION

The 2024 meeting of the Southeastern Section of GSA will be held in Asheville, North Carolina, on 15–16 April. Asheville offers easy access to the world-class geology of the Blue Ridge, Piedmont, Valley and Ridge, and Cumberland Plateau, with geologic locales including ancient orogenic belts, exotic mineral districts, active landslides, karst landscapes, and unique fossil sites. The Asheville Renaissance Hotel is downtown in the heart of it all—roughly 20 miles from the Asheville Regional Airport (AVL), and walking distance from the popular restaurants, breweries, shops, and other historic and cultural attractions.

REGISTRATION

Early registration deadline: 11 March 2024
Cancellation deadline: 18 March 2024
Register online at **www.geosociety.org/se-mtg**

Registration opens in January. All registration fees are listed in US$. For further information, or if you need special accommodations, please contact the general chair, Blair Tormey, btormey@wcu.edu.

Member Type	Early		Standard	
	Full Mtg.	One Day	Full Mtg.	One Day
Professional Member	US$225	US$150	US$275	US$175
Professional Member 70+ & 30-year member	US$125	US$100	US$175	US$125
Professional Nonmember	US$250	US$175	US$300	US$200
Early Career Professional Member	US$175	US$100	US$200	US$127
Student Member	US$85	US$65	US$100	US$85
Student Nonmember	US$105	US$95	US$130	US$105
K-12 Professional	US$50	US$45	US$55	US$50
Guest or Spouse	US$50	n/a	US$55	n/a
Field Trip/Short Course Only	US$40	n/a	US$40	n/a

CALL FOR PAPERS

Abstracts deadline: 9 Jan. 2024, 11:59 p.m. PST
Submit online at **www.geosociety.org/se-mtg**
Abstract submission fee: GSA members: professionals US$30, students US$18; non-members: professionals US$60, students US$36. If you cannot submit an abstract online, please contact Heather Clark, hclark@geosociety.org.

TECHNICAL PROGRAM

Geological Society of America Southeastern Section Keynote Address: Jennifer Bauer, Appalachian Landslide Consultants, jennifer@appalachianlandslide.com; *Endorsed by GSA Quaternary Geology and Geomorphology Division.* Monday, 15 April 2024, time and location TBA.

Symposia

S1. **Spanning an Orogen–From the Scandinavian Caledonides of Norway to the Southernmost Appalachians of Alabama: In Honor of the Career of James F. Tull.** *Endorsed by GSA Geochronology Division; GSA Geophysics and Geodynamics Division.* Clinton I. Barineau, Columbus State University, barineau_clinton@columbusstate.edu; Christopher Holm-Denoma, U.S. Geological Survey, cholm-denoma@usgs.gov; Mary Beth Lupo, Florida Geological Survey, mary.lupo@floridadep.gov.

S2. **Interstate Collaboration in the Southeast US–State Geological Surveys Working Towards Stratigraphic and Lithologic Equivalencies to Address Mapping Discrepancies More Effectively.** *Endorsed by GSA Geophysics and Geodynamics Division; GSA Limnogeology Division; GSA Sedimentary Geology Division.* Scott Howard, South Carolina Geological Survey, Howards@dnr.sc.gov; Kathleen Farrell, North Carolina Geological Survey, Kathleen.Farrell@deq.nc.gov; Phil Bradley, North Carolina Geological Survey, pbradley@deq.nc.gov.

Theme Sessions

T1. **Cores and Rocks from the Southeast Atlantic Continental Margin to Facilitate Interstate Correlation of Along-Strike Units: A Hands-On Poster Session to Support Symposium 2 (Posters).** *Endorsed by GSA Geochronology Division; GSA Limnogeology Division; GSA Sedimentary Geology Division.* Kathleen Farrell, North Carolina Geological Survey, Kathleen.Farrell@deq.nc.gov; Marcie Occhi, Virginia Department of Energy, Marcie.Occhi@energy.virginia.gov; Will Doar, South Carolina Geological Survey, Doarw@dnr.sc.gov; Mary Lupo, Florida Geological Survey, Mary.Lupo@floridadep.gov.

T2. **Geochemical Proxies for Marine and Continental Paleoenvironments.** *Endorsed by GSA Geobiology and Geomicrobiology Division; GSA Geochronology Division; GSA Limnogeology Division; GSA Sedimentary Geology Division.* Shane Schoepfer, Western Carolina University,

sschoepfer@wcu.edu; Thomas Tobin, University of Alabama, ttobin@ua.edu; Xikai Wang, University of North Carolina–Chapel Hill, xikai@live.unc.edu; Tian Gan, University of Maryland, gantian@umd.edu.

T3. **Magma, Heat, Fluids, and Critical Resources Across Tectonic Settings, Lithospheric Realms, Volcanic Systems, and Geologic Timescales.** *Endorsed by GSA Geochronology Division; GSA Geophysics and Geodynamics Division.* Mattia Pistone, University of Georgia, Mattia.Pistone@uga.edu; Paulo J. Hidalgo, Georgia State University, phidalgo@gsu.edu; Blake M. Wallrich, Vanderbilt University, blake.m.wallrich.1@vanderbilt.edu; Laura Bilenker, Auburn University, ldb0036@auburn.edu; Ryan Currier, University of West Georgia, rcurrier@westga.edu.

T4. **The Eastern Piedmont: The Last Frontier of Research in the Southern Appalachian Orogen.** *Endorsed by GSA Geochronology Division; GSA Geophysics and Geodynamics Division; GSA Quaternary Geology and Geomorphology Division.* Mark W. Carter, U.S. Geological Survey, mcarter@usgs.gov; David E. Blake, University of North Carolina–Wilmington, blaked@uncw.edu; Robert H. Morrow, IV, South Carolina Geological Survey, morrowr@dnr.sc.gov.

T5. **Carolina Terrane Origins and Evolution.** *Endorsed by GSA Geochronology Division; GSA Geophysics and Geodynamics Division.* Andy Bobyarchick, University of North Carolina–Charlotte, andybobyarchick@charlotte.edu; Shane Schoepfer, Western Carolina University, sschoepfer@email.wcu.edu.

T6. **Ductile to Brittle Deformation in the Southern Appalachians: Grenville to Present.** *Endorsed by GSA Geophysics and Geodynamics Division; GSA Quaternary Geology and Geomorphology Division; GSA Structural Geology and Tectonics Division.* Jackie Langille, University of North Carolina–Asheville, jlangill@unca.edu; Jamie Levine, Appalachian State University, levinejs@appstate.edu.

T7. **Sedimentology, Geochronology and Tectonics in the Southeastern United States and Beyond.** *Endorsed by GSA Geochronology Division; GSA Sedimentary Geology Division.* David L. Barbeau, Jr., University of South Carolina, dbarbeau@geol.sc.edu; Alex Pullen, Clemson University, apullen@clemson.edu; Andrew L. Leier, University of South Carolina, aleier@geol.sc.edu.

T8. **Geoscience Investigations of the Caribbean: Fundamental Science, Socioeconomic and Environmental Issues.** *Endorsed by GSA Geobiology and Geomicrobiology Division; GSA Geophysics and Geodynamics Division; GSA Limnogeology Division; GSA Marine and Coastal Geoscience Division; GSA Quaternary Geology and Geomorphology Division.* Liannie Velazquez Santana, University of Texas at Austin, velazqlc@miamioh.edu; Wilnelly Ventura Valentin, Miami University, venturwa@miamioh.edu; Mark Krekeler, Miami University, krekelmp@miamioh.edu.

T9. **In the Field or in the Lab: Revealing Hidden Signals from Minerals via Geochronology and/or Geochemistry.** *Endorsed by GSA Geochronology Division; GSA Limnogeology Division; GSA Quaternary Geology and Geomorphology Division.* Michelle Nelson, Virginia Department of Energy, michelle.nelson@energy.virginia.gov; William Odom, U.S. Geological Survey, wodom@usgs.gov; David Hawkins, Virginia Department of Energy, david.hawkins@energy.virginia.gov.

T10. **Water Quality Issues in the Southeast U.S.** *Endorsed by GSA Geobiology and Geomicrobiology Division; GSA Hydrogeology Division; GSA Limnogeology Division.* Madeline Schreiber, Virginia Polytechnic Institute and State University, mschreib@vt.edu.

T11. **Wetlands, Springs, and Streams: Hydrologic Studies at the Groundwater–Surface Water Interface.** *Endorsed by GSA Hydrogeology Division; GSA Limnogeology Division; GSA Marine and Coastal Geoscience Division; GSA Quaternary Geology and Geomorphology Division.* Jeff Wilcox, University of North Carolina–Asheville, jwilcox@unca.edu.

T12. **River Systems of the Eastern U.S.: Dynamics and Evolution from the Pleistocene to the Anthropocene.** *Endorsed by GSA Environmental and Engineering Geology Division; GSA Geochronology Division; GSA Limnogeology Division; GSA Quaternary Geology and Geomorphology Division.* Chris Norcross, North Carolina State University, conorcro@ncsu.edu; Karl Wegmann, North Carolina State University, kwwegman@ncsu.edu.

T13. **Quaternary Geology and Geomorphology of the Piedmont and Blue Ridge.** *Endorsed by GSA Limnogeology Division; GSA Quaternary Geology and Geomorphology Division.* Brad Johnson, Davidson College, brjohnson@davidson.edu; Martha Cary (Missy) Eppes, University of North Carolina–Charlotte, meppes@charlotte.edu.

T14. **Bridging the Gaps Between Landslide Hazard Policy, Research, and Practice.** *Endorsed by GSA Environmental and Engineering Geology Division; GSA Quaternary Geology and Geomorphology Division.* Bobby Sas, North Carolina Geological Survey, robert.sas@deq.nc.gov; Jeremy Jurgevich, North Carolina Geological Survey, jeremy.jurgevich@deq.nc.gov.

T15. **Current Technological Trends in Landslide Assessment and Susceptibility Studies: Innovative Digital Techniques, Collection Methods, and Modeling.** *Endorsed by GSA Environmental and Engineering Geology Division; GSA Geophysics and Geodynamics Division; GSA Quaternary Geology and Geomorphology Division.* Anne Carter Witt, Virginia Department of Energy, anne.witt@energy.virginia.gov.

T16. **Progress Towards Geologic CO_2 Storage in the Eastern United States.** *Endorsed by GSA Geophysics and Geodynamics Division.* Ryan Pollyea, Virginia Polytechnic

Institute and State University, rpollyea@vt.edu; David Riestenberg, Advanced Resources International, DRiestenberg@adv-res.com; Lars Koehn, Virginia Polytechnic Institute and State University, larsk@vt.edu; Jeremy Leierzapf, Advanced Resources International, jleierzapf@adv-res.com.

T17. **Paleoclimatology, Paleoecology, and Conservation Paleobiology: Old Tools and New Tricks for Unraveling the Past and Informing the Future.** *Endorsed by GSA Geobiology and Geomicrobiology Division; GSA Geochronology Division; GSA Limnogeology Division; GSA Marine and Coastal Geoscience Division.* Garrett Braniecki, University of North Carolina–Chapel Hill, braniegf@email.unc.edu; Molly Bost, National Oceanic and Atmospheric Administration, molly.bost@noaa.gov; Hunter Hughes, University of North Carolina–Chapel Hill, hphughes@email.unc.edu.

T18. **Vertebrate Paleontology Research in Southeastern North America.** *Endorsed by GSA Geobiology and Geomicrobiology Division; Southeastern Association of Vertebrate Paleontology.* Blaine Schubert, East Tennessee State University, schubert@etsu.edu; Josh Samuels, East Tennessee State University, samuelsjx@etsu.edu; Steven Wallace, East Tennessee State University, wallaces@etsu.edu.

T19. **Southeast Coastal Plain Stratigraphy.** *Endorsed by GSA Geochronology Division; GSA Marine and Coastal Geoscience Division; GSA Sedimentary Geology Division.* Anthony Boxleiter, Georgia State University, aboxleiter1@student.gsu.edu.

T20. **Past, Present, and Future Sea-level and Landscape Change on the U.S. Coast and Continental Shelf.** *Endorsed by GSA Geophysics and Geodynamics Division; GSA Marine and Coastal Geoscience Division; GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division.* Katie Luciano, South Carolina Geological Survey, lucianok@dnr.sc.gov; Blair Tormey, Western Carolina University, btormey@wcu.edu; Scott Harris, College of Charleston, HarrisS@cofc.edu.

T21. **Applied Geophysical Survey Methods and Mapping in the Southeast.** *Endorsed by GSA Geophysics and Geodynamics Division; GSA Quaternary Geology and Geomorphology Division.* Paul S. Martin, Martin Archaeology, psmartin@martinarchaeology.com; Blair Tormey, Western Carolina University, btormey@wcu.edu.

T22. **Undergraduate Research Poster Session (Posters).** *Endorsed by Council on Undergraduate Research Geosciences Division; GSA Geochronology Division; GSA Geoscience Education Division; GSA Limnogeology Division; GSA Marine and Coastal Geoscience Division; GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division.* Lee Phillips, University of North Carolina–Greensboro, plphilli@uncg.edu; Jeff Ryan, University of Southern Florida, ryan@mail.usf.edu.

T23. **Undergraduate Research Oral Session.** *Endorsed by GSA Geochronology Division; GSA Geoscience Education Division; GSA Limnogeology Division; GSA Marine and Coastal Geoscience Division; GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division.* Ashley Lynn, North Carolina Geological Survey, ashley.lynn@deq.nc.gov; Cheryl Waters-Tormey, Western Carolina University, cherylwt@wcu.edu.

T24. **Undergraduate and Graduate Posters with Lightning Talk (Posters).** *Endorsed by Council on Undergraduate Research Geosciences Division; GSA Geochronology Division; GSA Geoscience Education Division; GSA Limnogeology Division; GSA Marine and Coastal Geoscience Division; GSA Quaternary Geology and Geomorphology Division; GSA Sedimentary Geology Division.* Mary I. Abercrombie, Florida Gulf Coast University, mabercrombie@fgcu.edu; Mark Lord, Western Carolina University, mlord@wcu.edu; Marian Buzon, University of West Georgia, mbuzon@westga.edu.

T25. **Geologic Maps, Geophysical Maps, 3-D Geological Models, Digital Mapping Techniques, Map Derivatives, and Digital Map Preparation.** *Endorsed by GSA Geophysics and Geodynamics Division; GSA Quaternary Geology and Geomorphology Division.* Randy Kath, University of West Georgia, rkath@westga.edu; Karen Tefend, University of West Georgia, ktefend@westga.edu.

T26. **Expanding Your Professional Capacity: Navigating Leadership, Communication, Mentoring, Work-Life Balance, and Mental Health.** *Endorsed by GSA Limnogeology Division; GSA Marine and Coastal Geoscience Division; GSA Quaternary Geology and Geomorphology Division.* Jennifer Nocerino, The Geological Society of America, jnocerino@geosociety.org.

FIELD TRIPS

Trip registration opens in January 2024. For additional information, please contact the field trip co-chairs: Mark Carter, mcarter@usgs.gov, and Arthur Merschat, amerschat@usgs.gov.

Down the Escarpment and Across the Zone: A Transect from the Eastern Blue Ridge to the Western Piedmont; A Billion Years of Geology. *Endorsed by GSA Geochronology Division; GSA Geophysics and Geodynamics Division; GSA Quaternary Geology and Geomorphology Division.* Sat., 13 April. US$TBD. Bart Cattanach, North Carolina Geological Survey, bart.cattanach@deq.nc.gov; David Korte, North Carolina Geological Survey, david.korte@deq.nc.gov; Ashley Lynn, North Carolina Geological Survey, ashley.lynn@deq.nc.gov; Brennan Trantham, North Carolina Geological Survey, brennan.tranthan@deq.nc.gov.

Big Slow-movers, Debris Slides and Flows, and Mega-boulders of the Blue Ridge Escarpment, Western North Carolina. *Endorsed by GSA Environmental and Engineering Geology Division; GSA Quaternary Geology and Geomorphology Division.* Sun., 14 April. Jesse Hill, Appalachian Landslide Consultants, Jesse.Hill.Geology@gmail.com; Rick Wooten,

North Carolina Geological Survey (retired), Richard.M.Wooten@gmail.com; David Korte, North Carolina Geological Survey, david.korte@ncdenr.gov; Jennifer Bauer, Appalachian Landslide Consultants, jennifer@appalachianlandslide.com; Philip Prince, Appalachian Landslide Consultants, philip@appalachianlandslide.com; Jody Kuhne, Appalachian Landslide Consultants, jody@appalachianlandslide.com; Cheryl Waters-Tormey, Western Carolina University, cherylwt@email.wcu.edu; Lewis Owen, North Carolina State University, laowen2@ncsu.edu; Daria Khashchevskaya, North Carolina State University, dkhashc@ncsu.edu; Karl Wegmann, North Carolina State University, kwwegman@ncsu.edu.

Gray Fossil Site and Museum. *Sponsored by GSA Geobiology and Geomicrobiology Division; GSA Geoscience Education Division; National Association of Geoscience Teachers, NAGT Southeastern Section, and NAGT Teacher Education Division.* Sun., 14 April. Blaine Schubert, East Tennessee State University, schubert@etsu.edu; Josh Samuels, East Tennessee State University, samuelsjx@etsu.edu; Steven Wallace, wallaces@etsu.edu; Mick Whitelaw, East Tennessee State University, whitelaw@etsu.edu; Shawn Haugrud, East Tennessee State University, haugrud@etsu.edu; Season Nye, East Tennessee State University, nyea@etsu.edu.

Ophiolites of Buck Creek/Chunky Gal Mountain Area. *Endorsed by GSA Marine and Coastal Geoscience Division.* Sun., 14 April. Steven Maliner-Colvin, slmalcol@gmail.com.

Paleozoic Tectonics, Pleistocene Landforms, and Holocene Seismicity in the Blue Ridge: Results from Integrated Studies into the August 9, 2020, Mw 5.1 Earthquake Area near Sparta, North Carolina. *Endorsed by GSA Geochronology Division; GSA Geophysics and Geodynamics Division; GSA Quaternary Geology and Geomorphology Division.* Tues., 16 April, depart after the meeting ends, Thur., 18 April, return in the afternoon. Arthur Merschat, U.S. Geological Survey, amerschat@usgs.gov; Mark Carter, U.S. Geological Survey, mcarter@usgs.gov; Paula Figueiredo, North Carolina State University, paula_figueiredo@ncsu.edu; Kevin G. Stewart, University of North Carolina–Chapel Hill, kgstewar@email.unc.edu; Ashley Lynn, North Carolina Geological Survey, ashley.lynn@deq.nc.gov; William E. Odom, U.S. Geological Survey, wodom@usgs.gov.

SHORT COURSES

Short course registration opens in January. For additional information, please contact the short course chair: Kenneth Taylor, North Carolina State Geological Survey, Kenneth.B.Taylor@deq.nc.gov.

Classrooms, Careers, & Communities: Maximizing Your TA Experience. *Endorsed by GSA Limnogeology Division.* Christy Visaggi, Georgia State University, cvisaggi@gsu.edu; Katherine Ryker, University of South Carolina, kryker@seoe.sc.edu.

Fluorescent Dye Tracing: Putting Principles into Practice. *Endorsed by GSA Hydrogeology Division; GSA Limnogeology Division.* Lee Anne Bledsoe, Western Kentucky University, lee.bledsoe@wku.edu; Chris Groves, Western Kentucky University, chris.groves@wku.edu.

SPECIAL EVENTS

Walking Tour: Thomas Wolfe Memorial and Asheville Art Museum.
Saturday, 13 April, time TBA. Two destinations that can be visited together or separately: (1) Thomas Wolfe House ($5/adult for scheduled half-hour guided tour), not ADA compliant; (2) Asheville Art Museum ($13 senior, $15 adult) with optional (pay as you go) lunch at rooftop Perspective Café.

Tour: Folk Arts Center on Blue Ridge Parkway, North Carolina Arboretum, and Grovewood Village.
Sunday, 14 April, time TBA. Three destinations dependent on interest and accessibility needs. Van transportation will be provided. (1) Folk Arts Center on Blue Ridge Parkway (free admission), ADA accessible; (2) North Carolina Arboretum with lunch at Bent Creek Bistro (pay as you go), handicap accessible; (3) Arts and Crafts-era Grovewood Village: Biltmore Industries Museum, artisan shops, Antique Car Museum (free, with requested donation at antiques car museum), not ADA compliant.

Fountain at North Carolina Arboretum. Photo credit: JillLang / iStock / Getty Images Plus via Getty Images.

ACCOMMODATIONS

Hotel Registration deadline: 22 March 2024

A block of rooms has been reserved at the Renaissance Asheville Hotel, 31 Woodfin Street, in downtown Asheville, North Carolina. The meeting rate is US$194 per night plus tax. Reservations may be made directly by calling +1-800-468-3571 or via the hotel link at www.geosociety.org/se-mtg. Parking is available at the hotel for registered hotel guests at a reduced GSA rate of $10/day.

OPPORTUNITIES FOR STUDENTS AND EARLY CAREER PROFESSIONALS

Career Mentoring Luncheons

Ask your career-related questions and learn about nonacademic pathways in the geosciences while networking with professionals at the Roy J. Shlemon and John Mann Mentor Luncheons. GSA student members are welcome.

Career Workshop Series

This three-part series will feature career development planning, an exploration of geoscience job sectors, and information on best

practices for crafting a résumé and cover letter. Nontechnical skills and workforce statistics will be reviewed. The series will be led by workshop presenters and geoscientists. No registration is required, and everyone is welcome.

Learn more at **www.geosociety.org/mentors/.** Questions? Contact Jennifer Nocerino at jnocerino@geosociety.org.

Student Volunteers

Take advantage of work opportunities to earn free meeting registration. Students interested in helping with the various aspects of the meeting should contact Frank Forcino, Western Carolina University, flforcino@wcu.edu.

PROFESSIONALS

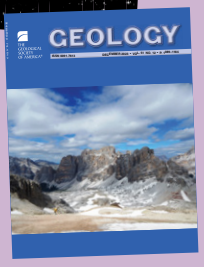
If you would like to share your interest, enthusiasm, and experience in applied geology, consider being a GSA mentor. Being a mentor is a rewarding experience. To learn more, contact Jennifer Nocerino at jnocerino@geosociety.org.

The meeting also offers an excellent opportunity to earn CEUs toward your continuing education requirements for your employer, K–12 school, or professional registration. The CEU certificate may be downloaded from the meeting website after the meeting.

LOCAL COMMITTEE

General Chair: Blair Tormey, btormey@wcu.edu
Technical Program Co-Chairs: Cheryl Waters-Tormey, cherylwt@wcu.edu; Shane Schoepfer, sschoepfer@wcu.edu
Field Trip Co-Chairs: Mark Carter, mcarter@usgs.gov; Arthur Merschat, amerschat@usgs.gov
Exhibits Co-Chairs: Ashley Lynn, ashley.lynn@deq.nc.gov; Scott Harris, HarrisS@cofc.edu
Volunteers Coordinator: Frank Forcino, flforcino@wcu.edu
Short Courses & Workshops Chair: Ken Taylor, kenneth.b.taylor@ncdenr.gov
Sponsorship & Events Co-Chairs: Bill Hames, hameswe@auburn.edu; Beth McClellan, emcclellan@radford.edu
Treasurer: Blair Tormey, btormey@wcu.edu
SE Section Treasurer: Katie Luciano, lucianok@dnr.sc.gov

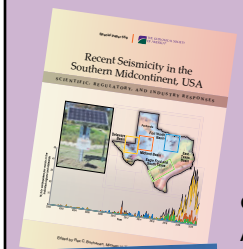
2024 GSA Science Editors



GSA depends on the volunteer efforts of many science editors, associate editors, and editorial board members to ensure the timeliness and quality of our publications.

GSA thanks the editors whose terms end 31 December 2023 for their service to the Society and to the science: **Christian Koeberl**, GSA books; **Brad Singer**, *GSA Bulletin*; **Andrew Barth**, *Geology*; **William C. Clyde**, *Geology*; and **Robert Holdsworth**, *Geology*.

Thank you to our continuing editors:



GSA books: **Joan Florsheim**, University of California, Santa Barbara; **Nancy Riggs**, Northern Arizona University (appointed to a second term)

GSA Bulletin: **Mihai N. Ducea,** University of Arizona; **Wenjiao Xiao**, Chinese Academy of Sciences

Geology: **Kathleen C. Benison**, West Virginia University; **Marc D. Norman**, Australian National University; **Urs Schaltegger**, University of Geneva; **Rob Strachan**, University of Portsmouth

Geosphere: **David E. Fastovsky**, University of Rhode Island; **Andrea Hampel**, Leibniz University Hannover; **Christopher J. Spencer**, Queen's University

GSA Today: **Peter Copeland,** University of Houston; **James Schmitt,** Montana State University

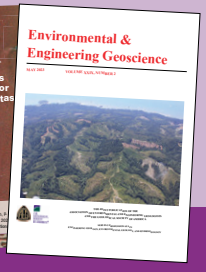
Environmental & Engineering Geoscience: **Eric W. Peterson**, Illinois State University

Please join us in welcoming the science editors beginning terms this month:

GSA books: **Shanaka de Silva**, Oregon State University

GSA Bulletin: **Troy Rasbury**, Stony Brook University

Geology: **Tracy Rushmer**, Macquarie University; **Finlay Stuart**, Scottish Universities Environmental Research Centre

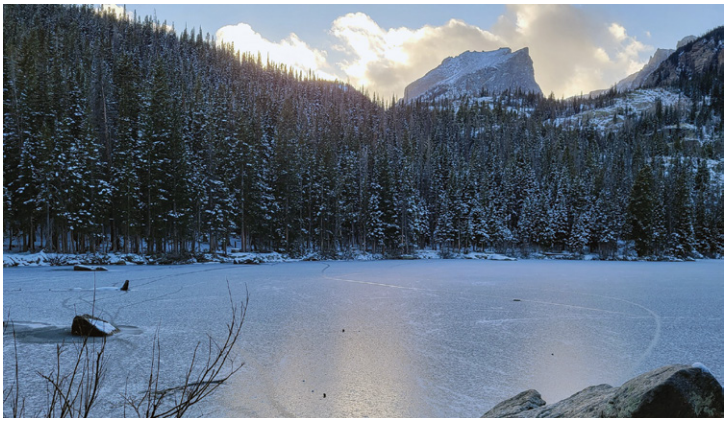


Find the current list of editors at
https://www.geosociety.org/GSA/Pubs/editors.aspx.

GSA FOUNDATION

Leading Into the New Year With New Faces and New Opportunity at the GSA Foundation

A flip of the calendar page into a new year carries the great promise of fresh beginnings, crisp new conversations and connections, bright views to shed new light on existing efforts—and all of these things are happening at the GSA Foundation! We invite you to join us in 2024 as we continue to expand the important work of supporting GSA programs and priorities for the advancement of the geosciences, in today's world and into the future.



WELCOME NEW GSA FOUNDATION TRUSTEES

The composition of the Foundation Board includes representation from academia; research institutions; industries such as energy and a leader in mining exploration and production; a woman-owned, geologist-led manufacturer of compasses and navigational equipment; environmental consulting; U.S. and foreign science policy arenas; and government. We are grateful for the breadth of experience and expertise each member brings to the board, including our three new Trustees, listed below.

Braimah Apambire,
Senior Assistant to the President for Global Sustainability and Director of the Center for International Water Sustainability, Desert Research Institute

Lauren Heerschap,
Owner, CEO, Sales & Marketing Director, Brunton

David Szymanski, PhD,
Associate Professor of Geology; Lead Investigator, Business and Science: Integrated Curriculum for Sustainability (BASICS), Bentley University

BE ONE OF ONE THOUSAND

At Connects 2023, we announced a new opportunity to join a cohort of like-minded individuals to provide an impressive cumulative impact in raising $1 million, in addition to regular annual contributions, to support GSA priorities. *One of One Thousand*, over the next several years, will offer a distinctive avenue to come together and make a difference for the geosciences through the Foundation. We appreciate the initial gifts made to kick off the initiative this fall. Keep an eye out for more information around this special group of donations and if you would like to join the effort, simply choose the option to Write In A Fund on GSAF's donation page [https://gsa-foundation.org/donate] and type in "One of One Thousand." Thank you for your unwavering commitment through GSAF.

Make an Impact—Self-Nominate for GSA Leadership and Committee Service!

Deadline: 15 June 2024
Terms begin 1 July 2025 (unless otherwise indicated)

Why self-nominate?
- You are the best source of information about your skills and expertise.
- You directly signal a commitment to serve on specific committees.
- Self-nomination is an excellent way to enhance your career.

Serving on a GSA committee allows you to:
- Contribute to strengthening GSA.
- Grow your professional network.
- Gain skills and knowledge that enhance your career.

Nomination Portal: **www.geosociety.org/get-involved**

GSA Headquarters Contact: Darlene Williams, +1-303-357-1060; dwilliams@geosociety.org.

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GSA COUNCIL

(3) Councilor (4-year term; E, M); President-Elect (3-year term; E, M)

The management of the affairs and the property of the Society shall be the responsibility of the Board, which shall also be known as the Council. The Council shall have the authority, power, and responsibility for the general management, control, and general supervision of the affairs, business, activities, property, and assets of the Society so that the corporate activities are consistent with the stated purposes of the Society and that no act is committed by the Society in contravention of its Articles of Incorporation or Bylaws. Primary duties are to attend and participate actively in all Council meetings, serve as an active member on an average of two GSA committees per year, and support the GSA Foundation. Further information can be found on the Who We Are page [https://www.geosociety.org/GSA/about/Who_We_Are] and the Leadership Resource Toolbox page on the GSA website [https://www.geosociety.org/GSA/About/Leadership/GSA/About/LdrResources.aspx].

ACADEMIC AND APPLIED GEOSCIENCE RELATIONS COMMITTEE

Member-at-Large, Student (3-year term; E, M)

This committee is charged with strengthening and expanding relations between GSA members in applied and academic geosciences. As such, it proactively coordinates the Society's effort to facilitate greater cooperation between academia, industry, and government geoscientists.

Qualifications: Committee members must work in academia, industry, or government and be committed to developing a better integration of applied and academic science in GSA meetings, publications, short courses, field trips, and education and outreach programs. Members must also be active in one or more GSA Divisions.

Professional Interest: Environmental & Engineering Geology, Hydrogeology, Karst, Quaternary Geology & Geomorphology, Structural Geology & Tectonics, Sedimentary Geology.

ANNUAL PROGRAM COMMITTEE

(2) Member-at-Large (4-year term; B, E, M); (1) Member-at-Large, Student (2-year term; B, E, M)

This committee is charged with developing a plan for increasing the quality of the annual and other society-sponsored meetings in terms of science, education, and outreach; evaluating the technical and scientific programs annually to identify modifications necessary for accomplishing the Society's long-range goals; conducting short- and long-range planning for the society meetings as a whole; and developing a long-term logistical plan/strategy for the technical programs of all GSA meetings and other society-sponsored meetings. One member-at-large should have previous meeting experience.

ARTHUR L. DAY MEDAL AWARD

(2) Member-at-Large (3-year term; E, T)

This committee selects candidates for the Arthur L. Day Medal.

Qualifications: Members should have knowledge of those who have made "distinct contributions to geologic knowledge through the application of physics and chemistry to the solution of geologic problems." All the committee's work will be accomplished during the months of February and March. All committee decisions must be made by 1 April.

B—Meets in Boulder or elsewhere; **E**—Communicates electronically; **M**—Meets at Connects; **T**—Extensive time commitment required during application review period

BASCOM MAPPING AWARD COMMITTEE

Member-at-Large, Student (3-year term; E, T)

This committee selects candidates for the Florence Bascom Geologic Mapping Award. This award acknowledges contributions in published high-quality geologic mapping that led the recipient to publish significant new scientific or economic-resource discoveries, and to contribute greater understanding of fundamental geologic processes and concepts.

Qualifications: Members should be knowledgeable in the field of mapping.

DIVERSITY IN THE GEOSCIENCES COMMITTEE

(2) Member-at-Large (3-year term; E, M)

This committee provides advice and support to GSA Council, raises awareness, and initiates activities and programs that will increase opportunities for diverse groups in the geosciences, particularly in the dimensions of race, ethnicity, gender, and physical abilities. The committee is also charged with stimulating recruitment and promoting positive career development.

Qualifications: Members of this committee must have professional or experiential knowledge of issues relevant to the goals of the committee. GSA strongly encourages nominations of members who are from the communities for which this committee is expected to serve.

DORIS M. CURTIS OUTSTANDING WOMAN IN SCIENCE AWARD COMMITTEE

(2) Member-at-Large (2-year term; E, M)

The purpose of this committee is to generate, receive, and evaluate candidates for the Outstanding Woman in Science Award. The award was established as a means to encourage women in the geosciences. Women are eligible for the first five years following their degree.

Qualifications: Members should have the ability to assess the contributions of those women who have made a major impact in the geosciences based on their PhD work.

EDUCATION COMMITTEE

College Faculty Representative (2-year term; B, E, M); Pre-College Educator (K-12) Representative (4-year term; B, E, M)

This committee works with GSA members representing a wide range of education sectors to develop informal, pre-college (K–12), undergraduate, and graduate earth science education and outreach objectives and initiatives.

Qualifications: Members of this committee must have the ability to work with other interested scientific organizations and science teachers' groups.

GEOLOGY AND PUBLIC POLICY COMMITTEE

(3) Member-at-Large (3-year term; E, M)

This committee provides advice on public policy matters to Council and GSA leadership by monitoring and assessing international, national, and regional science policy; formulating and recommending position statements; and sponsoring topical white papers. This committee also encourages active engagement in geoscience policy by GSA members.

Qualifications: Members should have experience with public policy issues involving the geosciences; ability to develop, disseminate, and translate information from the geologic sciences into useful forms for the public and for GSA members; and familiarity with appropriate techniques for the dissemination of information.

GSA INTERNATIONAL

(2) Member-at-Large (4 year terms; E, M)

This committee serves as GSA's coordination and communication resource seeking to promote, create, and enhance opportunities for international cooperation related to the scientific, educational, and outreach missions shared by GSA and like-minded professional societies, educational institutions, and government agencies. This committee also builds collaborative relationships with Divisions and Associated Societies in international issues and serves as a channel for member-generated proposals on international themes.

MEMBERSHIP AND FELLOWSHIP COMMITTEE

Member-at-Large, Academia (3-year term; E)

This committee contributes to the growth of the GSA membership, enhances the member experience, and serves a vital role in the selection of Fellows, with the goal of fostering a membership community as pertinent and global as our science. Committee members should understand what various segments of members want from GSA and should be familiar with outstanding achievers in the geosciences worthy of fellowship.

Qualifications: Committee members should have experience in benefit, recruitment, and retention programs.

NOMINATIONS COMMITTEE

Member-at-Large (3-year term; B, E)

This committee recommends nominees to GSA Council for the positions of GSA Officers and Councilors, committee members, and Society representatives to other permanent groups.

Qualifications: Members must be familiar with a broad range of well-known and highly respected geoscientists.

NORTH AMERICAN COMMISSION ON STRATIGRAPHIC NOMENCLATURE

GSA Representative (3-year term; E, M)

This committee develops statements on stratigraphic principles, recommends procedures applicable to classification and nomenclature of stratigraphic and related units, reviews problems in classifying and naming stratigraphic and related units, and formulates expressions of judgment on these matters.

Qualifications: Members must be familiar with the fields of paleontology, biostratigraphy, and stratigraphy. Term commences 1 December 2025.

PENROSE CONFERENCES AND FIELD FORUMS COMMITTEE

(2) Member-at-Large (3-year term; E); (1) Member-at-Large, Early Career Professional (3-year term; E)

This committee reviews and approves Penrose Conference and Field Forum proposals and recommends and implements guidelines for the success of these meetings.

Qualifications: Committee members must be early career scientists or professionals.

PENROSE MEDAL AWARD COMMITTEE

Member-at-Large (3-year term; E, T)

Members of this committee select candidates for the Penrose Medal Award. Emphasis is placed on "eminent research in pure geology, which marks a major advance in the science of geology."

Qualifications: Members should be familiar with outstanding achievers in the geosciences worthy of consideration for the honor. All of the committee's work will be accomplished during the months of February and March. All committee decisions must be made by 1 April.

PROFESSIONAL DEVELOPMENT COMMITTEE

Member-at-Large, Student (3-year term; E)

This committee directs, advises, and monitors GSA's professional development program; reviews and approves proposals; recommends and implements guideline changes; and monitors the scientific quality of courses offered.

Qualifications: Members must be familiar with professional development programs or have adult education teaching experience.

PUBLICATIONS COMMITTEE

Member-at-Large (4-year term; B, E, M)

The primary responsibilities of the committee are nominating candidates for editors when positions become vacant, reviewing the quality and health of each Society publication, and presenting an annual report to Council that shall include recommendations for changes in page charges, subsidies, or any other publishing matter on which Council must make a decision. To carry out this charge, headquarters will provide the committee with all necessary financial information.

RESEARCH GRANTS COMMITTEE

(12) Member-at-Large (3-year term; B, T)

The primary function of this committee is to evaluate approximately 800 graduate student research grant applications and award specific grants to chosen recipients, including some named grants supported by funds within the GSA Foundation.

Qualifications: Members may come from any sector (academia, government, industry, etc.) and should have experience in directing research projects and in evaluating research grant applications. GSA strongly encourages nominations of geoscientists from diverse backgrounds and institutions, particularly from minority serving institutions. **Extensive time commitment required 15 Feb.–15 April**; each member reviews approximately 40 applications.

More information: www.geosociety.org/gradgrants

YOUNG SCIENTIST AWARD (DONATH MEDAL) COMMITTEE

Member-at-Large (3-year term; E, T)

Committee members investigate the achievements of young scientists who should be considered for this award and make recommendations to GSA Council.

Qualifications: Members should have knowledge of young scientists with "outstanding achievement(s) in contributing to geologic knowledge through original research which marks a major advance in the earth sciences." All the committee's work will be accomplished during the months of February and March. All committee decisions must be made by 1 April.

Committee, Section, and Division Volunteers: Council Thanks You!

GSA Council acknowledges the many member-volunteers who, over the years, have contributed to the Society and to our science through involvement in the affairs of the GSA. Your time, talent, and expertise help build a solid and lasting Society.

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Introducing GSA's New Career Hub!

- Job Board
- Advice and Coaching
- Career Resources
- Salary Data
- Resume Tools
- and More!

Insung Jeon/Moment via Getty Images

The 37th International Geological Conference (IGC) Mentoring and Travel Grant Program

BEXCO, Busan, South Korea | 25–31 Aug. 2024

GSA, the GSA Foundation, and the U.S. National Committee for Geological Sciences (of the National Academy of Sciences) are accepting applications for their Mentoring and Travel Grant Program to the 37th International Geological Conference (IGC) in Busan, South Korea.

Who should apply: Graduate students and early career professionals (within seven years of receiving their last degree). Applicants must be residents or citizens of the United States and be enrolled in, or employed at, a U.S. institution. Awards will be a maximum of US$3,500.

Deadline to apply: 10 Apr. 2024

www.geosociety.org/field-experiences

Questions? Contact Jennifer Nocerino, jnocerino@geosociety.org

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JOURNAL	Impact Factor 2023	Impact Factor 5-YEAR	SUBMIT ONLINE
Geology	5.8	5.9	geology.msubmit.net
GSA Bulletin	4.9	4.8	gsabulletin.msubmit.net
Geosphere	2.5	3.4	geosphere.msubmit.net
E&EG	.9	.8	www.editorialmanager.com/eeg

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CONNECTS 2024

22–25 September
Anaheim, California, USA


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Mark your calendar for 22–25 September for an unforgettable experience at GSA Connects 2024 in Anaheim, California, USA! Help shape the future of geoscience exploration and discovery by submitting a proposal for a short course and/or technical session. This year's meeting themes are *Water in Our Changing World* and *Life along an Active Margin.*


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ELEVATE YOUR INFLUENCE

Chair a technical session

Help create a meeting program that will inspire imaginative insights. Submit your proposal for a Pardee Keynote Symposium or topical session.

Deadline: 1 Feb. 2024


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SPARK CURIOSITY

Teach a short course

This is a fantastic opportunity to share your expertise by designing and leading an impactful short course. Courses can range from a half day to two full days and may be conducted in-person or online.

Deadline: 1 Feb. 2024

community.geosociety.org/gsa2024