

2010 MEDALS & AWARDS

ARTHUR L. DAY MEDAL

Presented to George E. Gehrels



George E. Gehrels
University of Arizona

Citation by Peter G. Decelles

It is a pleasure to introduce George E. Gehrels as the 2010 Arthur L. Day Medalist for “distinction in contributing to geologic knowledge through the application of physics and chemistry to the solution of geologic problems.” Over a nearly 30-year career, the man known affectionately as Robochron has made significant contributions in the fields of U-Th-Pb geochronology and tectonics. George has been a tireless force in developing and applying U-Th-Pb geochronology to a variety of tectonic problems worldwide. His staggering publication record (>250 and counting) stems in part from his generosity and collaborative spirit. Over the past ten years, he has developed the Arizona LaserChron Center and made available to the broader geoscience community a pair of multicollector-laser ablation-inductively coupled plasma mass spectrometers. Under direct supervision by George, these instruments have generated more than 1,000,000 U-Th-Pb ages, and they serve as a test-bed for experimental development and application of techniques to measure Hf, Li, and B isotope ratios, and trace element and REE concentrations in accessory minerals along with U-Th-Pb ages. This work includes custom design to enable more efficient and higher precision data collection. Through the development of the LaserChron Center, George has ignited a revolution in detrital provenance and chronostratigraphic studies aimed at determining amalgamation histories

of continents and associated continental-scale sediment transport systems. Literally hundreds of scientists, from undergraduates to full professors, have collaborated with George to generate an extraordinary amount of geochronological data. George’s development of the LaserChron Center and the numerous discoveries that have come from it are important research accomplishments that demonstrate the power of engaging the geoscience community in fundamental geochronology over a wide range of problems. This work continues to demonstrate a conviction that the community is doing good science and that any serious scientist should have access to state of the art facilities with equal opportunity to discover something big.

George is equally well known for his work in tectonics, contributing significantly to understanding of the tectono-magmatic histories of key orogenic systems throughout the world. In the American Cordilleras, George has been a stalwart in assessing the origin and accretion history of Cordilleran “suspect” terranes from South America to Mexico to Nevada to Alaska, working out the geological evolution of the Coast Mountains batholith and adjacent terranes, documenting provenance of Paleozoic-Mesozoic miogeoclinal strata, and helping to constrain models for the Baja-BC hypothesis. The four-paper series with Bill Dickinson on the Colorado Plateau sets the standard for how detrital zircon studies should be done.

In Nepal, George began to work on the problem of Himalayan tectonostratigraphy in the mid-1990’s by analyzing hundreds of detrital zircons from the Neogene foreland basin deposits and various bedrock outcrops throughout the orogenic belt. Although this work was done by the laborious thermal ionization method, it represented at the time of publication an order of magnitude increase in the size of the available of U-Th-Pb database from the Himalaya. From this work George and his collaborators were able to work out relationships among Himalayan tectonostratigraphic units at unprecedented levels of detail and accuracy, in some cases completely inverting erroneous concepts that were entrenched in the Himalayan literature. This work has profoundly influenced our understanding of pre-Himalayan Greater India and northern Gondwanaland, and how structural cross-sections of the Himalaya are constructed and retrodeformed. George then turned to northern and central Tibet and worked out Mesozoic and Paleozoic paleogeographies and tectonic histories of these central Asian fragments.

Above all these research accomplishments stands George’s legendary collegiality, generosity, and humility. He teaches classes with more than 1,000 undergraduate students (in a single lecture hall). He is a wise and thoughtful mentor to graduate students. He is particularly dedicated to helping disadvantaged and returning students at all levels. He has involved platoons of undergraduates in research over the years. He routinely teaches short courses to educate the geosciences community in potential applications of U-Th-Pb geochronology. His attention to precision, accuracy, efficiency and spatial resolution is remarkable. It is not entirely about regional applications—it is about making sure that these regional applications have the advantage of the best analyses available. He works around the clock, leading many of us to wonder if he ever actually sleeps.

George Gehrels is among the few who may accurately claim to have generated a revolution in the way we do science. From his early work using TIMS technology, to his ongoing deployment of high through-put LA-MC technology, to the establishment of the most productive geochronology laboratory in the world, George has almost single handedly made it possible for hundreds of scientists to generate absolute blizzards of high-quality data on *any geologic topic* involving U-Pb geochronology.

For all of these accomplishments and more, George Gehrels is truly deserving of the Day Medal.

Response by George E. Gehrels

It is a great pleasure and honor to be awarded this year’s Arthur L. Day Medal. I am truly humbled to see the list of previous recipients of this award, and to receive this award among such distinguished company.

It is noteworthy that one of Dr. Day’s intentions for this award was to inspire further effort. This is a relief to me, as I have not yet figured out what I really want to do as a geologist. I’ve always wanted to be a structural geologist, like George Davis, my undergraduate mentor, and be able to describe faults and folds in a way that makes them come alive in your imagination. I’ve also wanted to be a tectonics guru, like Greg Davis, my MS advisor, and develop his ability to recognize important relationships in the field and then decipher the tectonic processes that they record. I also really admire Jason Saleeby, my Ph.D. advisor, because he is so

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creative in the way that he pieces together geologic information. And nowadays I look around at my colleagues at Arizona, and I think: I should try to be as scholarly as Pete DeCelles — he's at the top of his game as a sedimentary geologist, but he's constantly learning how to incorporate new information from other disciplines. Or I should follow in the path of Joaquin Ruiz, who as College Dean is amazingly effective at facilitating the research of others. Some days I even imagine that I can keep up with Bill Dickinson, but of course that will never happen

I truly have been fortunate to be able to learn from and work with such an impressive array of geologists, although this has made it challenging to settle on the ideal career path. But in the meantime, I gotta tell you, I am having a blast doing the research that Pete described. Who would ever have guessed that U-Pb ages of detrital zircon crystals would have such a huge impact on so many different types of studies? I'm also having a lot of fun looking after a geochronology lab that supports the research of faculty members and students from across the country. For me the highlight is when a student sits down to run

the first sample from their thesis area: they take backgrounds ... fire the laser ... watch the ages come in ... and exclaim "wow, I never expected **that** age from this sample!"

So I'd like to finish by thanking my colleagues for providing such amazing learning opportunities, for inviting me to collaborate with them on their research projects, and for their nomination for the Day Medal. And of course I'd like to thank the Geological Society of America and Dr. Arthur Day for making this award possible.