

2014 MEDALS & AWARDS

YOUNG SCIENTIST AWARD (DONATH MEDAL)

Presented to
Francis A. Macdonald



Francis A. Macdonald
Harvard University

Citation by Galen Halverson

Francis Macdonald, this year's Donath Medalist, is a field geologist. Fieldwork is his passion, and the Neoproterozoic Era is his muse. His proclivity and appetite for mapping structurally complex terrains, logging unforgiving sections, and traversing hours on end over mountains and across valleys, through rain, sleet, fog, and bear-infested buck brush is vast. In the eleven short years since Francis began his PhD with Paul Hoffman, he has carried out intensive fieldwork in Alaska, Yukon, Namibia, Mongolia, and Death Valley, amongst other exotic and challenging locations. In each case, he has corrected previous mapping blunders and erected a much improved stratigraphic framework. And in every case, the revised mapping and stratigraphy have motivated new tectonic models and other key revelations. And so the exceptionally preserved Precambrian-Cambrian boundary interval in the Dzabkhan terrane in Mongolia was deposited in a foreland basin as it collided with an arc; the North Slope subterranean of northeastern Alaska was pinched from northeastern Canada; the oldest biomineralized fossils in the geological record are now positioned correctly at about 800 Ma; the Sturtian glaciation began 717 Ma and overlaps the emplacement of the Franklin Large Igneous Province; and the Neoproterozoic stratigraphy in Death

Valley—well, it just makes sense now. And the list goes on.

In addition to sorting out the stratigraphy and the tectonics, Francis and his geochronology colleagues have added a torrent of timely U-Pb and Re-Os radiometric ages. In the past four years, they have led the charge in calibrating the Cryogenian Period and solved the nagging conundrum of the duration and synchronicity of the Sturtian glaciation: one and long-lived. Many more critical new ages are in the pipeline.

Francis is the hub in a whirlwind of interesting and cutting edge research. His pioneering and comfort-defying fieldwork has paved the way for a troupe of geochemists, paleontologists, sedimentologists and others—both like-minded and not—to extract ever more information from the rocks he has tamed. But he is not content simply to lead colleagues into the field or shuttle rocks to other labs—although he does this with gusto. Often as not, Francis rolls up his sleeves and pounds away at the interpretations of novel geochemical and paleontological data sets, drawing on his relentless curiosity and impressive command of a diverse literature. In this regard, he is reminiscent of his PhD supervisor, whose legendary feats in the field are mirrored by his intellect in the office and the conference hall.

When one ponders the extraordinary collection of amazing stratigraphic sections, well-placed geochronological samples, and exquisitely preserved carbonate samples Francis has amassed, one cannot help but think that he is unusually lucky. But this luck has been hard earned through weeks, months, and years in the field and an insatiable drive to understand the ancient Earth and share this knowledge with others.

Response by Francis A. Macdonald

Thanks Pippa—it has been a blast to work with you in the Yukon. I have cherished talking rocks with you, not only on the outcrop, but also in the cook tent when we get throttled by storms, and throughout the year when we are crushed by classes.

First off, I thank GSA, my letter writers, and the Donath family for this honor. There is no society I could be more proud to be associated with, let alone receive an award from.

Any successes I've had in Geology have been due in large part to great mentors, collaborators and students. Because all of my work is collaborative, bringing together geology, geochemistry, and paleontology, I

have many people whom I'm indebted to, and although I cannot thank them all there is a few that I should embarrass by association. My geochronology work has been dependent on the wizardry of Jim Crowley, Mark Schmitz, and Alan Rooney. My paleontological studies could not have been possible without the eagle eyes of Sara Pruss, Tanja Bosak, and Phoebe Cohen. My geochemical thinking has been enlightened with the brilliance and generosity of Dan Schrag and David Johnston.

As an undergrad, Joe Kirschvink and Jason Saleeby gave me confidence and inspiration to pursue Geology. Joe along with Carolyn Shoemaker helped me get my geological career started mapping impact craters in Australia on a Watson Fellowship, and I wear a bolo tie of Gene's today with pride. My PhD advisor, Paul Hoffman, gave me the freedom to explore and fail, and continues to challenge me about every detail (including the orientation that I put staples into papers and the luster of the coin I use for scale in photos), but he has also supported me at every turn.

When I started my thesis in Alaska I was fortunate to cross paths with Bill McClelland (at a Cordillera GSA meeting), who set me straight and disavowed me of some bad ideas, and since then I have been pushed further than I could have imagined by my student Justin Strauss.

I first went to Mongolia with my good friend Davey Jones and was lucky to have Uyanga Bold as a field assistant. Uyanga then became a student with me and along with her mother has made our work possible. Our Mongolia work has bloomed with the hard work and mapping by both Uyanga and Emmy Smith.

I thank Tony Prave for introducing me to the geology of Death Valley. He managed to look past my associations with Harvard and recommend regions for teaching field camp. Since then, Tony has become a mentor and a friend.

Recently, two years ago at the GSA meeting in Charlotte, I randomly met Paul Karabinos through a friend and we began chatting about the Taconic orogeny. This again led to a new and fruitful research direction. Indeed, I am indebted to the GSA not only for this award but also for facilitating some of my best collaborations.

Lastly, and most appropriate to a GSA in the Canadian Cordillera, I thank Charlie Roots from the GSC. My first contact in the Yukon was Charlie Roots from the GSC. Charlie brought me into his family, took me

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to his thesis area, and has supported all of my work and that of my students. Charlie is a great gentleman and has made long-lasting contributions to the understanding of Yukon geology.

I also thank my wife, Kelsey, for putting up with my long field seasons and infrequent showering.

Thank you Charlie, thank you Donath family, and thank you GSA!

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Francis A. Macdonald's Gold Medal Lecture at
<http://www.geosociety.org/awards/14speeches/GML-Donath.pdf>