



Mineralogical Association of Canada

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THE 2023 PINCH MEDAL AWARDED TO DR. BRUCE CAIRNCROSS

The **Pinch Medal**, awarded biannually, recognizes major and sustained contributions to the advancement of mineralogy by members of the collector-dealer community. The Mineralogical Association of Canada is honored to present **Dr. Bruce Cairncross** with this award.

As you are all aware, thousands of mineral collectors and dealers worldwide collaborate with the scientific community to the great benefit of mineralogy. Without their contribution, our knowledge of new minerals would progress at a much slower rate.

Bruce is a worthy recipient of the Pinch Medal with a long and sustained track record as a mineral collector and photographer. He is recognized for an outstanding contribution to the documentation of the minerals and mineral localities of southern Africa.

Dr. Bruce Cairncross was born in Standerton, South Africa in 1953. He holds a master's degree in geology from the University of Natal (South Africa) and a doctorate in geology from the University of the Witwatersrand (South Africa). He is currently Emeritus Professor of Geology at the University of Johannesburg (South Africa), his employer for the past 34 years. He is a Life Fellow of the Geological Society of South Africa and has served the Society in various capacities, including as Honorary Secretary of the Sedimentology Division and as a member of the Conservation Committee, the Centennial Co-ordination Committee, the Activation Committee, and the Professional Affairs Committee. Bruce is a past Vice President of the International Association of Sedimentologists.

The Geological Society of South Africa (GSSA) presented Bruce with the Presidential Award in 2009 for services rendered to the Johannesburg Geological Museum and South African mineral heritage. In 2020, he was honored with the Draper Medal by the GSSA, the highest award this learned society can bestow, for lifetime achievements and contributions to South African geology and geoheritage.

As an educator, Bruce has supervised 28 master and doctoral students, and taught undergraduate and graduate classes in mineralogy, sedimentology, stratigraphy, and economic geology. From a research standpoint, he has written and cowritten 13 mineral-related books and authored and coauthored 173 geological and mineralogical articles. He has presented 145 public lectures, mostly on minerals and gemstones of southern Africa.

Bruce is an accomplished mineral and gemstone photographer. He has twice won the National Research Foundation / South African Agency for Science and Technology Advancement first prize in the "Science as Art" category (2011 and 2020), and twice won the Tucson Gem & Mineral Show Mineral Photography Contest (2009 and 2013).



FIGURE 1 Cairncrossite, 4 cm, associated with richterite, sugilite, and pectolite. Wessels mine, Kalahari manganese field, South Africa. BRUCE CAIRNCROSS SPECIMEN AND PHOTO.



FIGURE 2 Bruce with his mineral collection and a few of his photos.



FIGURE 3 Discussing minerals with Bill Pinch at the Executive Inn, TGMS, 1993.



FIGURE 4 At the Riemvasmaak fluoroite workings in the Northern Cape Province, South Africa, 2008

His interest in minerals began at an early age while still at school, collecting agates along the banks of the Vaal River. His curiosity in rocks and minerals was encouraged by his parents, who were both interested in natural history. "Serious" mineral collecting began in 1975 when, as a green-horn student working at the Gorob Copper Prospect in the Namib Desert, the project geologist, an avid mineral collector, introduced him to the minerals of Tsumeb and Berg Aukas. Shortly thereafter, Bruce discovered the *Mineralogical Record*, and has been a subscriber ever since. He

now serves as an Associate Editor for the publication. Similarly, he is Consulting Editor for *Rocks & Minerals*. These publications opened his novice mineral collector's eyes to minerals and mineral localities worldwide. Several visits to the Tucson Gem and Mineral Show, and more recently the Munich Show, increased his interest and awareness in international minerals, although his own collection focuses primarily on southern African specimens. He has personally visited Aris, Rössing, Tsumeb, Berg Aukas, Erongo, Goboboseb, Klein Spitzkoppe, Karibib, and Rosh Pinah in Namibia; and the Okiep copper mines, several mines in the Witwatersrand goldfield and Bushveld Complex, Messina, Kimberley, Boekenhouthoek, Palabora, Riemvasmaak, and Vergenoeg. Bruce has written articles on all these localities. Perhaps most significantly, his sustained interest and involvement in the Kalahari manganese field resulted in Giester et al. in 2016 naming the mineral cairncrossite in his honor, for "contributing significantly towards awareness of diversity of the mineralogy of Southern Africa."

The Mineralogical Association of Canada is proud to recognize the long-term dedication and efforts of members of the collecting community. **Dr. Bruce Cairncross** is an exceptional member and, considering his contributions to the science of mineralogy, we are pleased to award him the **2023 Pinch Medal**.

MAC STUDENT TRAVEL/RESEARCH GRANT AWARDS IN 2022

The Mineralogical Association of Canada (MAC) awarded eighteen Student Travel and Research Grants in 2022 that totaled \$15,000. Report excerpts from five of the recipients follow.



Fiona D'Arcy is a PhD student at McGill University (Canada) under the supervision of Dr. John Stix. Her research examines volatiles, like carbon dioxide and water, and their role in eruption processes as well as their interaction with the environment. This research uses unoccupied aerial vehicles to sample gases, examine volatile contents in nominally anhydrous minerals, and investigate environmental proxies of volcanic gas emissions using

isotopes in tree rings. With the MAC Student Travel/Research Grant, she traveled to the 2023 Scientific Assembly of the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) in Rotorua, New Zealand. The IAVCEI Scientific Assembly was an invaluable opportunity for D'Arcy to meet with the world's experts on volcanic research. She presented on her work at Stromboli Volcano where she has been working on unraveling the volatile behavior behind the July 2019 paroxysmal eruption. During the conference, D'Arcy was involved in many opportunities for networking and learning about local outreach, Māori culture, and the geothermal industry. She was co-convenor of the pre-conference workshop on community-driven best practices of drone use in volcanology and took part in post-conference geology field trips to many ignimbrite deposits in the Taupo volcanic zone.



Derek D. V. Leung is a PhD student at Laurentian University (Canada) under the supervision of Prof. Andrew M. McDonald. The MAC Student Travel/Research Grant allowed him to conduct laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) analyses at the Queen's Facility for Isotope Research at Queen's University (Kingston, Canada) and synchrotron micro-X-ray fluorescence (SμXRF) analyses at the Canadian Light Source (Saskatoon, Canada).

The LA-ICP-MS analyses were used to determine the proximal-to-distal trace-element variations in green micas from the Kerr-Addison deposit (Virginiatown, Ontario, Canada), which forms a core component of Leung's PhD project on elucidating the genetic relationships between green micas and gold deposits. The 2D SμXRF maps will be correlated with 3D synchrotron microtomography datasets to determine the spatial relationships between green micas and native gold on the microscale. It is anticipated that the analytical approach and results from this study will be expanded to other gold deposits associated with green micas worldwide, with the potential to enhance the exploration for gold deposits.



Gabriel Santos defended his PhD dissertation on December 6, 2022, at the University of Waterloo (Canada), under the supervision of Drs. Shoufa Lin and Cees van Staal. His work focused on the petrology and tectonic setting of the deformed ophiolitic Liuyuan Complex in the southern Central Asia Orogenic Belt, north-western China. The MAC Student Travel/Research Grant allowed Santos to attend the 2022 Bay of Islands Complex workshop in western Newfoundland, Canada. In this workshop, Santos was part of a weeklong field trip with world-leading experts in the petrology of ophiolites, igneous processes in mafic cumulate rocks, and the tectonics of accretionary orogens. The stratigraphy and magmatic processes of the Bay of Islands ophiolite were explored in detail in a series of on foot, helicopter, and boat traverses. This allowed Santos to compare the deformed ophiolitic rocks he has been studying in China with one of the best-preserved and best-studied ophiolites on the planet. Santos also presented the preliminary results of his PhD project and participated in discussions that proved invaluable for the conclusion of his PhD research.



Kaitlyn Crawford completed her undergraduate degree in geology at Brandon University (Canada) in 2018, and then went on to work in greenfield exploration for three seasons. She is currently working toward her MSc under the supervision of Joyce McBeth and Benoit Plante at the University of Regina (Canada). Her research focuses on humidity cell testing, an ASTM standard for prediction of acid and contaminated mine drainage. In particular, she

is looking at how microbiology and temperature may influence the geochemistry of the test results from two sites in northern Quebec. This will help with scaling-up effects from laboratory to mine site. However, the tests used in her research are laboratory scale tests and do not take into consideration geochemical heterogeneities within the tailings, such as hardpan formation. The funds from the MAC Student Travel/Research Grant allowed her travel to Quebec and sample a third mine site to characterize the microbiology across five vertical sections.



Mary Macquistan graduated with her BSc in geology (and a minor in mathematics) from the University of Ottawa (Canada) in 2021. She is now working on her MSc at the University of British Columbia (Canada) under the guidance of Dr. Lee Groat, studying the formation of rare barium silicate minerals at the Gun occurrence in the Yukon Territory. Through thin section and hand sample petrography, with supplementary information from backscatter electron imaging,

automated mineralogy mapping, and electron probe microanalyses, Macquistan is compiling a detailed paragenetic sequence for the Gun. With the support of the MAC Student Travel/Research Grant, Macquistan was able to collect the single crystal, optical, and chemical data required to characterize a new barium tungsten mineral identified during the course of her thesis work. These data will allow Macquistan to apply to the International Mineralogical Association for approval of a new mineral species, and, if approved, it will be the subject of her first peer-reviewed journal article.