



LOS ANGELES BASIN GEOLOGICAL SOCIETY

February 2024 Meeting Announcement

Looking Closer and Seeing Further: The Multiple Facets of Gem Geology and Microanalysis

Dr. Rachelle Turner, Independent Researcher, recently Gemological Institute of America's Richard T. Liddicoat Postdoctoral Research Fellow

Thursday, February 29th, 11:30AM
Signal Hill Petroleum, 2633 Cherry Ave., Signal Hill
2nd floor Conference Room,

Abstract

With advanced research capabilities, our ability to look closer and further is ever increasing. The advent of in-situ techniques like secondary ion mass spectrometry has brought a renaissance in the geoscience and gemology worlds. Small spot sizes of 10 microns, about 1/10th the width of a human hair, enable us to capture fine-scale chemical zonation in crystals, revealing details about a crystal's growth and geological inputs during crystallization. A survey of oxygen isotope ratios in gem corundum, the mineral name for sapphire or ruby gems, reveals the complex dynamics of processes that form sapphires and rubies, which are often poorly understood. Deeply scavenged sapphire crystals from Montana exhibit vastly different signatures from crustal, syenite-associated sapphires from Burma as a result of the geologic settings in which they crystallize—processes and inputs that can be traced by analyzing the isotope geochemistry of sapphires at a level of spatial and analytical precision that was previously not possible. Coupled with geochronology of syngenetic zircon inclusions in sapphire, these datasets offer valuable insights into the nature of corundum genesis at different deposits and allow us to understand the geologic settings that form gem corundum, a chemically simple but geologically enigmatic mineral.

Biography

Dr. Rachelle Turnier is currently an independent researcher, recently completing her position at the Gemological Institute of America as a Richard T. Liddicoat Postdoctoral Research Fellow. She earned her Ph.D. in Geoscience at the University of Wisconsin-Madison, studying under Dr. John Valley, focusing on the isotope geochemistry of sapphires formed in various geologic settings. As a geochemist with a penchant for fieldwork, Dr. Turnier has collected research samples from several important localities, including Naxos (Greece), Mogok (Myanmar), and Montana (USA). Applying detailed analyses at the micron scale to samples collected directly from the source allows her to answer large-scale questions about the geologic conditions of corundum formation. Dr. Turnier continues to utilize a variety of analytical techniques such as hyperspectral imaging, trace element geochemistry, U-Pb zircon geochronology, and Raman spectroscopy to advance our understanding of gem corundum. As a science ambassador and public servant, she has spoken to a variety of audiences about the importance of research and science communication.

Luncheon prices, cash or check

Lunch and Talk (pre-registered)	\$25.00
Retired:	\$20.00
Student:	\$10.00
Walk-ins:	\$35.00

Reservations are required by noon, February 26th, at labgs.org/meeting_info.html or directly contact LABGS Secretary Joseph Landeros at (626) 497-1710 or landerosjd@gmail.com.

Geologic Book/Paper Giveaway! Students take note!

Selections from a highly curated collection of books and papers from the late Jean Paul Chauvel, a career Union Oil of California geologist, will be available to attendees for free. Maybe you will find that rare book or paper you've been looking for, or haven't been looking for! Note that when things go out of print, they get expensive and hard to find.

Volunteer!, it is good for you, your network, and your knowledge!

The LABGS is currently looking for a Treasurer.

Please let any of us know below if you are interested. Fringe benefits include learning how to run a local Society – no small feat!, hanging out with some of the coolest geologists around, occasional free food, and being part of freeform discussions on how to improve and grow our local geologic community.

"There was no respect for youth when I was young, and now that I am old, there is no respect for age. I missed it coming and going."

- J.B. Priestley (1894 - 1984)

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