

The Geographic Origin of Diamonds, Sapphire from China, and Pigments Sourced from Gem Materials



Welcome to the Fall 2022 edition of *Gems & Gemology*! This issue delivers fascinating new content, offering four feature articles ranging from the hot topic of diamond origin to an in-depth look at the role gem materials have played in art throughout history.

In our lead article, Evan Smith and coauthors explore the methods and challenges associated with determining the geographic origin of diamonds. Current approaches have attempted to associate trace element characteristics with specific origins, but there is still no scientifically robust method to determine the geographic origin of a given diamond. The authors conclude that the only definitive method to establish

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diamond origin depends on preserving and retaining origin information from the time of mining rather than determining it analytically.

Next, authors Yimiao Liu and Ren Lu of the Gemmological Institute, China University of Geosciences in Wuhan, examine sapphire from a lesser-known source in Muling, China. Comparing their samples with sapphire from well-known sources worldwide, the authors report on the quality, gemological characteristics, and origin-related features with comprehensive analytical results. They determine that Muling sapphire is from a more diverse geological environment than the sapphire from many other regions.

In our third article, join Britni LeCroy for a lesson in art history as she researches pigments historically sourced from gem materials. Covering hematite, azurite, malachite, lapis lazuli, bone, ivory, and cinnabar, the study investigates the evolution of pigments in a wide array of artistic mediums, from ancient cave drawings to modern paintings.

Finally, Yicen Liu and coauthors present their spectroscopic investigation of the color mechanism of pink spinel reportedly from Kuh-i-Lal in the Pamir Mountains of Tajikistan. To determine the cause of color, the group examines the mechanism of color change from room temperature to 1000°C using spectroscopic techniques and trace element analysis.

Meanwhile, our regular features continue to deliver interesting findings from all over the globe. Highlights from the *Lab Notes* section include an exceptional natural-color 1.21 ct red diamond, a *gota de aceite*-like effect in a Brazilian emerald, and the first report of a natural pearl discovered in a *Telescopium* shell. *Micro-World* is packed with illuminating observations from the inner landscapes of gemstones, offering a glimpse at an unusual brightly colored purple fluid in quartz, “smoke ring” inclusions in heated blue sapphire, and a large orange rutile inclusion in a “chameleon” diamond. *Diamond Reflections* returns with an exploration of fluid inclusions in natural diamond, highlighting the scientific value these inclusions offer from the great depths of the earth. In *Gem News International*, you’ll find an update from Mozambique’s ruby mines, a report on the first-ever Turquoise United conference in Albuquerque, and highlights from current gem and mineral exhibits at the San Diego Natural History Museum and the Perot Museum of Nature and Science in Dallas.

We hope you enjoy the latest issue of *Gems & Gemology*!

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