

The Science of Phenomenal Gems, a Summary of Pegmatites, and a Cutter's Remarkable Journey



In 1934, *Gems & Gemology* editor Robert Shipley made two promises to readers in our first issues: to enhance the knowledge and abilities of gem practitioners so they could better protect consumers' best interests, and to supplement the knowledge of gemology students. Our summer issue fits squarely within his vision.

We offer just one feature article on the broad and fascinating topic of phenomenal gems, which aims to deliver everything a practicing gemologist wants to know about these special gems but was afraid to ask. GIA authors Dr. Shiyun Jin, Nathan Renfro, Dr. Aaron Palke, and Dr. James Shigley provide a comprehensive review of gem

materials that display special optical phenomena, including iridescence, schiller, and

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asterism, under specific lighting or viewing conditions. The resolution and wider availability of

modern analytical techniques have enabled scientists to improve their studies of phenomenal gems dramatically. Unfortunately, much of this new knowledge hasn't transferred into the trade, leading to confusion and misinformation. The authors aim to help close the knowledge gap between the practical gemology world and mineralogy and physics research by reviewing scientific investigations into optical processes and submicron textures that cause phenomena. Their paper sorts phenomenal gems by the dimensionality and complexity of their underlying submicron structures and textures. We trust this article, along with its thorough list of references, will become a valuable resource for practitioners, researchers, and students of gemology alike.

To gemologists and mineral collectors, complex pegmatites are a cornucopia of rare elements and therefore may host uncommon minerals and remarkable crystal specimens. *Colored Stones Unearthed* dives into this important gem source.

In the Spotlight profiles the extraordinary life of gem cutter Ben Kho. His journey encompasses entrepreneurial origins as a gem trader and cutter through the adversity of Cambodia's Killing Fields to a fresh start and success in the United States—a unique tale of perseverance and the power of talent. Kho's artistry is exemplified by the award-winning colored gems he's faceted during his exceptional career.

G&G's regular columns provide the latest gemological findings. Noteworthy updates from GIA's laboratories are summarized in *Lab Notes*, including unusual patterns in diamonds composed of dark micro-inclusions, a pezzottaite with multiple cat's-eyes, and a quartz assemblage imitating emerald. *Micro-World's* inner landscapes of gemstones feature "goose bumps" on a South Sea pearl, mystery pebbles in quartz, and a unique phantom crystal in diamond. Finally, highlights from the *Gem News International* section include emerald and beryl from Kazakhstan and Ukraine and unique trapiche grossular from China.

Please enjoy the latest edition of *Gems & Gemology*!

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