

Conferences

IGE 2014 International Gemmological Congress and 16th FEEG Symposium

On 17–19 January, in Madrid, Spain, the IGE 2014 Congress was organized by the Spanish Gemmological Institute (Instituto Gemológico Español or IGE), and held together with the annual Symposium and Diploma Ceremony of the Federation for European Education in Gemmology (FEEG). More than 200 attendees from 16 countries took part in the event. Sixteen oral and four poster presentations were given, and nine workshops and demonstrations were held, covering a wide range of topics related to modern gemmology. All materials from the event, including extended abstracts of the presentations, can be downloaded at www.ige.org/congress2014.

Diamonds were covered in various presentations. **Juan Cózar** (IGE Gem Testing Lab, Madrid) and co-authors explained the use of a combination of advanced techniques—Raman and photoluminescence (PL) spectroscopy and the DiamondView—for the detection of colourless HPHT- and CVD-grown synthetic diamonds and HPHT-treated colourless diamonds. A comparison of PL spectra recorded at room temperature and at -180°C confirmed the necessity of cryogenic testing when performing PL spectroscopy. In another presentation, **Cózar** (with **Anthony Cáceres**) provided colour grading data for hundreds of diamonds examined in his lab using a Sarin Colibri colorimeter, and compared these results to traditional visual grading with diamond master stones. The Colibri instrument showed variations of up to four colour grades from visual grading, especially in diamonds with non-typical colours. **Geoffrey Dominy** (Gemmologist FGA with Distinction, Canada) focused on the importance of the cut grade in diamond valuation, including the role of the cutter, the importance of yield, and how shape, clarity, colour, cut, optical phenomena and market considerations affect the overall value of a faceted diamond. (In a separate presentation, he also presented his new book titled *The Handbook of Gemmology*, which was reviewed on pages 252–253 of *The Journal of Gemmology*,

Vol. 33, No. 7–8, 2013). **Dr Pilar Diago Diago** (Zaragoza University, Spain) provided an overview of the problem of ‘conflict diamonds’ in international trade, with a general explanation of the Kimberley Process and related international and European laws. **Igor Klepikov** (St. Petersburg State University, Russia) and co-authors presented a detailed spectroscopic study of diamonds from alluvial deposits of the north-eastern Siberian platform. Optical absorption, infrared, PL and electronic paramagnetic resonance spectroscopy were used to characterize nitrogen aggregates and crystal structure defects in 120 diamonds. The micromorphology of diamond crystals from the north-eastern Siberian platform was reported by **Nadezhda Erysheva** (St. Petersburg State University, Russia), who found a direct relationship between microrelief features and crystal habit. **G.F. Anastasenko** (St. Petersburg State University, Russia) and co-authors studied the morphological characteristics of alluvial diamonds from the north-eastern Siberian Platform by scanning electron microscopy. The crystals were dominated by octahedral, dodecahedral and combined forms, with flat- and curve-sided shapes. **Anastasenko** and co-authors also described a diamond collection in the mineralogical museum of St. Petersburg State University consisting of more than 1,000 rough samples. The collection started in 1875 with the acquisition of diamonds first from Brazilian deposits and then from South Africa. After the discovery of diamonds in Yakutia (Siberia) in 1954, the museum obtained a large number from both primary and secondary deposits.

Among coloured stone presentations, **Miguel Ángel Pellicer García** and **Dr Cinta Osácar Soriano** (Zaragoza University, Spain) discussed the challenges of the geographic origin determination of coloured stones (Figure 1), with some examples from published studies on emerald, ruby, sapphire and garnet. The authors emphasized the importance of using comparison samples of known origin in such studies, and



Figure 1: The IGE 2014 Congress and 16th FEEG Symposium were held at the Spanish Gemmological Institute in Madrid. This photo was taken on the first day of the Congress during a presentation by Miguel Ángel Pellicer García and Dr Cinta Osácar Soriano. Courtesy of IGE.

also the necessity of establishing the range of property variations within each deposit. **Dr Klaus Schollenbruch** (DGemG, Idar Oberstein, Germany) summarized glass filling treatments for ruby and sapphire, including the processes used, diagnostic features and stability issues for the treated stones. **José Antonio Espí** (Madrid School of Mines, Spain) explained the geological setting, formation process and mining of larimar (blue pectolite) deposits in the Dominican Republic. He showed spectacular photos of larimar substituting for ancient fruit and tree trunks. He found greater amounts of vanadium and copper in larimar samples with a deeper blue coloration. **Espí** also described the origin and geology of amber deposits in the Dominican Republic. The amber is hosted by two major geographic domains: the Cordillera Septentrional (or Northern Range, where primary deposition sites occurred in clay-rich host rocks) and Cordillera Oriental (or Eastern Range, where remobilization and concentration of amber occurred in alluvial paleochannels with an abundance of organic material). Texture and sometimes colour are related to the specific conditions of amber formation. **Oscar R. Montoro** (Madrid Complutense University, Spain) and co-authors provided evidence of chemical processes that occurred during the formation of fossil resins, by examining the reactivity of pure communic acids and comparing their FTIR and Raman spectra to those of fossil resins. The results

may help differentiate amber from other natural and synthetic resins.

Three presentations covered evolving technology. **Helena Calvo del Castillo** (University of Liège and Belgian Gemmological Association, Belgium) presented a review of a wide range of advanced spectroscopic techniques used in gemmology, their principles, advantages and limitations, as well as examples of their use to resolve contemporary problems. **Mikko Åström** and **Alberto Scarani** (M&A Gemological Instruments, Finland and Italy) described their GemmoRamanPL-532SG instrument, a scientific grade Raman-PL spectrometer for gemmological laboratories. They also explained some applications of this instrument beyond standard gem identification, such as identifying jade and spinel treatments, characterizing emerald, determining the colour origin of cultured freshwater pearls and coral, discriminating Imperial topaz according to chromium content and quickly separating type I from type II diamonds. **Menahem Sevdemish** and **Guy Borenstein** (GemeWizard, Ramat Gan, Israel) presented the latest developments of GemeWizard, a digital colour communication and analysis system for coloured gemstones and fancy-colour diamonds. The system allows users to describe, grade, price and communicate the colour of gems. A digital colour-based online gem marketplace, GemeShare, is used to perform colour analysis on a vast scale, and a search engine

enables the user to search for a stone of a specific colour.

In other presentations, **Gonzalo Moreno Díaz-Calderón** (IGE, Madrid) explained the Virtual Gemmological Laboratory, an online educational tool from IGE designed for distance learning of gemmology. Students are taught how to use basic gemmological equipment and even virtually analyse gems using a polariscope, refractometer, spectroscope, hydrostatic balance and microscope. **Dr Pilar Diago Diago** (Zaragoza University, Spain) and **Dr Cinta Osácar Soriano** provided an example of cooperative and interdisciplinary education through seminars on the legal aspects of gemmology that are attended by students of both gemmology and law, as well as professionals from the jewellery sector. **Viktor Tuzlukov** (College of Gem Cutting, Moscow, Russia) provided his vision of lapidary work as an artistic creation process. He showed how his designs can evoke symbols in the pattern of their facets.

The following **workshops and demonstrations** were held during the Congress:

- Raman and photoluminescence spectroscopy in the gemmological laboratory, by Mikko Angstrom and Alberto Scarani, M&A Gemological Instruments, GemmoRaman.com
- GemRam Raman gem identification system, by Ignacio Sánchez-Ferrer Robles, Microbeam S.A.
- Digital grading and pricing of coloured stones and fancy-colour diamonds with the

GemeWizard system, by Menahem Sevdermish and Guy Borenstein, Gemewizard.com

- Detection of synthetic diamonds using the DiamondView, by Juan Cózar and Anthony Cáceres, IGE Gem Testing Laboratory
- OGI Scanox Planner HD, a device for the digital analysis of diamond cut quality, by Juan Cózar and Anthony Cáceres, IGE Gem Testing Laboratory
- Inclusion photomicrography using MacroRail products and software, by Óscar Fernández Arcís, MacroRail.com
- Automated 3D/360° photography applied to gems and jewellery, by Óscar Fernández Arcís, MacroRail.com
- Advanced methods for the design and manufacture of new gem cuts: GemCad, GemRay and DiamCalc, by Egor Gavrilenko, IGE
- Analysis of jewellery and precious metals with X-ray fluorescence, by Joan Pujol, Fischer Instruments S.A.

The FEEG Diploma Ceremony and the IV Antonio Negueruela Jewelry Design Awards Ceremony took place during the last evening of the Congress.

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AGA Tucson Conference

The 2014 Accredited Gemologists Association Conference in Tucson, Arizona, USA, took place 5 February, with the theme 'Gems: Fabulous, Fake, and Nefarious?' **Donna Hawrelko** chaired the conference and was also warmly recognized for her leadership of AGA at this conclusion of her term as president.

Olivier Segura (Laboratoire Français de Gemmologie, Paris, France) summarized the identification criteria for natural, treated and cultured pearls. Treatments may be revealed by observation of dye concentrations or by chemical analysis and Raman spectroscopy. General

indications of a cultured origin may be provided by observations of the drill hole (if present) and surface characteristics. For confirmation of natural or cultured origin, it is necessary to view the internal structures with X-radiography or X-ray computed tomography, and some challenging case studies were described (for one example, see pages 14–15 of the Gem Notes section).

Thomas Hainschwang (GGTL Gemlab–Gemtechlab Laboratory, Principality of Liechtenstein) delivered a presentation for **Franck Notari** on the cause of colour and potential radiation hazards of green diamonds. He indicated that

the only samples that can be reliably ascertained as natural colour are those mined during the early part of the 20th century (mostly from Brazil) that have been kept in museums since that time. Extremely high residual radioactivity may be shown by diamonds irradiated by direct contact with radium salts, particularly those with residues that are trapped in open cracks and cavities. By contrast, diamonds that have been treated by modern irradiation methods (e.g. with electrons) pose no radiation risk to the end user.

Hainschwang then reviewed luminescence phenomena in diamond and their importance in gem testing. The colour and distribution of luminescence can be a useful indicator for the origin of a diamond's colour, but extensive experience is needed. Similar luminescence colours may be caused by a variety of defects, so photoluminescence spectra are needed to assess and measure defects at extremely low concentrations when determining the origin of colour or whether a diamond is natural or synthetic.

Manfred Eickhorst (Eickhorst & Co., Hamburg, Germany) explored applications of LED lighting in gemmology, including refractometer stands with built-in strong yellow LEDs, polariscopes with LEDs that provide diffuse lighting, and microscopes with intense illumination

of a yellowish colour that mimics traditional incandescent lamps.

Craig Lynch (Somewhere In The Rainbow Collection) described the challenges of building a world-class gemstone and modern jewellery collection. In addition to the problem of finding available pieces due to their rarity, establishing a fair price for them can be difficult since there are so few top-end pieces for comparison.

Dr Lore Kiefert (Gübelin Gem Lab, Lucerne, Switzerland) documented the mining and gemmology of sapphires from Mogok, Myanmar. During a 2013 visit to the mines, she witnessed extensive sapphire mining activity, and she noted that some of the stones recently produced (which are of metamorphic origin) may be confused with sapphires of basaltic origin.

Shane McClure (Gemological Institute of America, Carlsbad, California, USA) examined the potential for the co-diffusion of multiple elements into sapphire. Relatively thick layers (up to 1 mm) of diffused blue colour due to Ti and Fe have been seen recently in both natural and synthetic sapphires, and the presence of surface-related concentrations of additional elements such as Mg, Ga, V and/or Be suggests that they may enhance the diffusion process.

Brendan M. Laurs

NAJA Conference in Tucson

The 41st Annual Winter ACE-It Education Conference organized by the National Association of Jewelry Appraisers took place in Tucson, Arizona, USA, on 2–3 February 2014. (Also, a preconference seminar on 1 February was given by **Dr Cigdem Lule**, titled 'Emerald Treatments and Pricing Workshop'.) NAJA executive director **Gail Brett Levine** introduced the conference and helped everything run smoothly. This author attended the talks described below, and additional presentations were also given by **Steve Begner** ('Southwestern Indian Silverwork and Jewelry—In The Eye of The Appraiser'), **Martin Fuller** ('The Many Faces of Value'), **Sindi Schloss** ('Exotic Organics in Jewelry'), **Patrick**

Coughlin ('Discovering, Marketing and Branding a Gemstone') and **Arthur Skuratowicz** ('How Much is that Bauble in the Window?').

Edward Boehm (RareSource, Chattanooga, Tennessee, USA) presented useful techniques for assessing gem rough while on the go. He described using a loupe (and especially the darkfield loupe) to help identify rough material and determine its quality for cutting, and how a dichroscope is useful for separating spinel from sapphire and tourmaline from pezzottaite. To become proficient at using a loupe to observe inclusions, he suggested looking at several example stones with a microscope and then training your eye to see the same features with the loupe. He also emphasized the importance

Figure 2: This carved Mogul emerald is photographed to show its transparency, colour and the intricate carved patterns on its surface. Known as the Schettler Emerald, it weighs 87.64 ct and was probably used in the head ornament of a prince. Courtesy of the American Museum of Natural History, New York, USA; photo by Tino Hammid.



of learning the properties of gems, and how a collection of journals and the *Photoatlas* books are gemmological tools in themselves.

Tino Hammid (Tino Hammid Photography Inc., Los Angeles, California, USA) discussed gem photography while showing examples of spectacular images (e.g. Figure 2) to illustrate several points: (1) lighting defines an object, and the use of selective and subtle reflections helps to convey its shape; (2) shadows provide a sense of place, and reflections of the object below the stone add reality to the image; and (3) colour accuracy is critical, and using a ColorChecker card and a monitor calibrator are highly recommended.

Gary Bowersox (GeoVision Inc., Honolulu, Hawaii, USA) described his multiple trips over 42 years to Afghanistan for exploring mines, purchasing gem rough, and helping the local people through education and donations. He mentioned that access to the Panjshir Valley emerald deposits is much easier since a new road from Kabul to Khenj was constructed in 2013. However, reaching the original lapis lazuli mines at Sar-e-Sang in Badakhshan Province is much more difficult, as shown in a fascinating film clip that he screened for the audience.

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