

**Report on the symposium on
Advances in Gem & Diamond Detection Technology-2019 (AGDDT-2019)
during August 7&8, 2019 in BDB & IJS**

Gemmological Institute of India (GII) has organized a one and a half day international symposium on the Advances in Gem & Diamond Detection Technology-2019 (AGDDT-2019) during August 7&8, 2019. The symposium was organized to provide a forum for exchanging ideas among scientists, technologists, trades and members of testing laboratories. About 150 members from different backgrounds but connected to Gem and Diamonds actively participated in the deliberations on both the days. Internationally renowned experts from USA, China, Thailand, Switzerland and Belgium participated and gave a world view of the contemporary issues dealing with scientific aspects of diamonds and coloured gem stones. This symposium is unique in bringing the experts on both diamonds and coloured gem stones on to the same platform who gave a learned and holistic view of all aspects of diamond gem stone testing and related issues; the major focus was on laboratory grown diamonds and their detection ; treatments and colour grading of rubies and sapphires. Highlights were on the detection of synthetic diamonds including natural-synthetic diamond doublets, matters related to pigeon blood red rubies and Kashmir sapphires.

Day 1 was dedicated for exchanging current information on scientific and technological developments in gems and diamonds in the form of invited talks by internationally renowned experts. Day 2 was dedicated for three panel discussions on trade related issues, QA/QC & Lab standardization and, current state of art of detection and certification methods and methodologies, with experts as panel members..

The symposium was inaugurated by three stalwarts in the trade, Shri Bakul R. Mehta, Chairman, GII, Shri P.A. Agarwal, Chairman, GJEPC and Shri Anoop Mehta, President, BDB. Shri Bakul Mehta emphasized the importance of R&D that benefits Society in general and community in particular. He told that development and deployment of QChk machine by GII is one such example. Shri P A Agarwal enumerated various export promotional activities of GJEPC as well as support extended to institutes like GII. Shri Anoop Mehta emphasized importance of developments and need for such symposia for taking the stock of developments and look forward to such meetings periodically. In the beginning Dr. AVR Reddy, Secretary of AGDDT briefly presented the theme of the symposium, after welcoming the guests, and set the context of the symposium.

Dr. Thomas Moses ,Senior Vice President of GIA, USA delivered the key note address on contemporary issue of great concern to diamond traders and consumers alike viz., the Laboratory grown diamonds (LGDs) and explained various aspects of Lab grown diamonds right from the beginning and had put in perspective the detection method.. In line with the theme of the symposium, Ms Richa Singh, DPA in her address explained the need an outcome of project assure in which various instruments were evaluated with a predetermined set of measurements. Inaugural session ended with vote of thanks proposed by Shri Arvind Parikh, President, DEAL.

First Session of day -1 was focused on Diamond related talks by experts discussing the methodologies followed at well reputed laboratories on the synthetic diamond detection. The session was chaired by Dr. Wuyi Wang , Vice president (Research) at GIA. Session started with an informative talk on Detection of Laboratory Grown Diamonds (LGDs) : Experiences at GII by Dr. M.D Sastry, GII that was followed by a talk by Dr. Taijin, NGTC, China on Chinese Synthetic Diamonds and the Detection / Identification at NGTC Laboratories. Dr. Dheeraj Jain from BARC spoke on Synthesis of Diamond Films for Technological Applications by CVD Methods. Ms. Ann Van Spaendonk, Belgium explained Latest Scientific Developments regarding Detection Methods for Synthetic Diamonds in HRD. Dr. Wuyi Wang gave an informative talk on Lab grown Fancy-Colored Melee Diamonds and their Identification.

Second Session of Day 1 was focused on Coloured Gemstone related topics and was chaired by Dr. Taijin Lu. Session started with a talk on Effect of Treatment on Lattice Phonon Spectrum in Natural Corundum by Mr. Mahesh Gaonkar, GII. Dr. Cavalieri gave detailed information on Responsible Sourcing in the Coloured Gemstone Sector: The

Development of a Harmonised due-Diligence Standard. Dr. Thanong Leelawatanasuk spoke on importance of Colour grading of Pigeon Blood Ruby, Royal Blue & Cornflower Blue Sapphire and their colour grading. He illustrated different aspects with recent experiences in GIT, Thailand. Dr. Wenxing Xu, SSSF, Switzerland, explained in detail on her studies of Origin Determination of Kashmir Sapphire; she had elegantly shown the importance of chemical and isotopic analysis LA-ICP-MS, Zircon inclusions and their Raman spectral studies for the identification of Kashmir sapphires. Her presentation elegantly demonstrated the role of these techniques in identifying the youngest deposit (i.e of Kashmir) of blue sapphires compared to those from Sri Lanka. It was followed by an informative talk on African Gem Deposits: Some Important Case Studies by Mr. Prateek Jhaveri. Session ended with an apt summary by Dr. Taijin Lu.

Second day presentations consisted of three panel discussions and aptly the venue is shifted to IJS, Goregaon and many traders showed interest to participate in Panel Sessions Three panel discussions were aimed at discussing various aspects of synthetic diamonds, colour enhancements, Detection methods, measurements, certification etc. Panel discussion sessions were inaugurated by Shri Bakul Mehta, Shri Sanjay Shah, Convener, Diamond Panel and Shri Mehul Shah, Vice President, BDB. Through their addresses they have set the Context of the panels.

Panel 1 was on **Trade related matters and concerns which was effective** anchored by *Mr. Pranay Narvekar* and Panel Members: were Mr. Shreyance Shah, Mr. Sabyasachi Ray, Mr. Suresh Shah, Mr. Ramazan Alak Mete and Mr. Neel Pethe. They have addressed various aspects arising due to artificial production of diamonds and various treatments of gem stones for colour enhancement. Lab grown diamonds have essentially same physical, chemical, structural, optical and visual characteristics. Only growth patterns are different. Discussions centered mainly around possible effects in the trade due to entry of lab grown diamond.

Panel 2 was on **QA/QC, and lab standardisation and was anchored by** *Mr. Samir Joshi* and Panel Members: Ms. Nirupa Bhatt, Mr. Ramazan Alak Mete, Ms. Natasha Coutinho, Dr. Sumed Prasongpongchai, Dr. A V R Reddy and Dr. Cavaleiri. Quality Assurance and Quality Control (QA/QC) is an important aspect in every walk of life including gem and diamond characterisation, certification and trade. Advent of gem grade lab grown diamonds and their entry into markets, warrants high quality / high standard reporting to keep the consumer confidence. Panel discussions centred around availability of standard equipment in the labs, methods and methodologies of measurement, need for standard equipment, internationally certified reference materials and calibrated procedures. Discussions started with a detailed presentation by anchor and members answered focused questions.

Panel 3 was on the **State of the art Detection methods and certification requirements** was anchored by Dr. M D Sastry and Panel Members were Dr. Taijin Lu, Ms. Ann Van Spaendonk, Dr. Thanong Leelawatanasuk and Dr. Wenxing Xu. All-round development in electronics & solid state detectors, availability of lasers and evolution of computers have resulted in developing a large number of instrumental methods. The issues discussed in the above two panels suggested the need to develop expertise with matching instrumentation and methodologies. Anchor and Panel members highlighted the state of the art methods to detect LGDs from melee-star sizes to carat size diamonds, characterisation of natural and synthetic diamonds, characterisation of gemstones, origin studies and so on so forth.

AGDDT was closed by proposing a vote of thanks by Shri Anup Zaveri, Managing Trustee, GII. He thanked all involved in the Organization of AGDDT-2019 as it needed co-operation and dedicated hard work from many committee members, members from GII, experts from all over globe who delivered talks as well as participated in panel discussions, and active support extended by many members from GJEPC, BDB, and DEAL

A V R Reddy
Secretary, AGDDT-2019 & CEO, GII