23rd General Meeting of the International Mineralogical Association
Cité Centre de Congrès de Lyon, France

Following the tradition of quadrennial general meetings of the International Mineralogical Association (IMA) organized by national societies, the French Society for Mineralogy and Crystallography will host the 23rd General Meeting of the IMA in Lyon, France during 18–22 July 2022.

2022 is the year to celebrate mineralogy. It marks the bicentennial of the death of René Just Haüy (born 1743), who is the father of modern mineralogy and crystallography. Two centuries ago, Haüy published his seminal works Traité de minéralogie and Traité de cristallographie. Fast-forward to 2022, the two most recent Mars exploration programs, Perseverance (Mars2020) and Huoxing 1, are flooding us with amazing data and remarkable results. With the return of a sample capsule from Hayabusa2, fragments of a primitive carbonaceous asteroid have now been analysed for the first time.

The 23rd Meeting of the IMA will celebrate these momentous occasions. We, the organizers, would like to paint IMA 2022 with the colours of space exploration. Alongside the more traditional mineralogists, we want to inspire the emerging next generation of scientists and take a step closer toward the final frontier. The meeting will bring together all the new facets of modern mineralogy. It will be a playground, where planets, the stars, asteroids, meteorites, and crystals will meet planetary exploration of the 21st century, and it will be the place to celebrate two centuries of mineral sciences.

This General Meeting will offer stimulating plenary lectures by the world’s leading scholars, society events, short courses, award ceremonies, presentations from funding agencies, national business meetings, and about 60 scientific sessions grouped under several overarching themes:

- **T1** – Extraterrestrial mineralogy
- **T2** – Planetary interiors
- **T3** – Mineral systematics, gems, collections
- **T4** – The dynamic world of minerals
- **T5** – Environmental mineralogy and biomineralogy
- **T6** – Applied, ore, and industrial mineralogy
- **T7** – Mineralogy and petrology

With such a diversified technical program, everyone will be sure to find a session in their area of expertise, or venture outside their familiar territory to learn about new discoveries, techniques, and ideas of modern mineralogy. Particular emphasis will be placed on societal issues by facilitating discussions, cross-field symposia, and sessions to address the current challenges in ore and raw materials supply, energy and environmental sustainability, health, and cultural heritage.

Lyon is well known for its remarkable historical and architectural landmarks that earned it the status of UNESCO World Heritage Site. The city was recognized as an important area for the production and weaving of silk from the late 1400s and through the Industrial Revolution. Unsurprisingly, the first programmable loom was invented here by the Lyonnaise weaver Jean Marie Charles – two centuries ago, as well! It is also the city, where Auguste and Louis Lumière invented the cinematograph at the end of the 1880s. Today, Lyon is a major hub for the chemical, pharmaceutical, and biotech industries. And let’s not forget its reputation as the gastronomic capital of France (some even say the world)! In the heart of Europe, this city can be easily reached from anywhere in the world, and serves as a gateway to Languedoc, Dauphiné, Burgundy, and the Western Alps with the iconic Mont Blanc. The venue is the Lyon Convention Centre, an impressive state-of-the-art facility featuring 25,000 m² of innovative interior architecture and situated between the Rhône River and Tête d’Or Park. The venue is ideally situated close to the historic center and public transportation routes.

To stay updated, please regularly visit the official conference website (https://ima2022.fr) and follow us on Facebook (https://www.facebook.com/IMA2022/) and Twitter (@CongressIma).

We look forward to seeing you in France this summer!

Mineralogy is one of the oldest branches of science, and it has played a key role in the deciphering of the structure of matter and in the development of science and technology. To commemorate the bicentennial of the death of René Just Haüy, the International Mineralogical Association declared 2022 the YEAR OF MINERALOGY.

Mineralogy 2022 is a global initiative intended to highlight the importance of mineral sciences in our everyday lives. Mineralogy 2022 will consist of coordinated activities on the regional, national, and international levels. These activities will underscore the significance of mineralogy as a basic science. As such, all Mineralogy 2022 activities will take place under the patronage of the International Year of Basic Science for Sustainable Development declared by UNESCO (https://www.iybssd2022.org/en/).

While the Year of Mineralogy 2022 will be launched during the 23rd General Meeting in Lyon, outreach, promotional, and other activities are already in full swing and will continue beyond July 2022.
The IMA is delighted to present its 2022 Medal of Excellence to Patricia M. Dove, Distinguished Professor and C.P. Miles Professor of Science at Virginia Polytechnic Institute and State University, USA. She has been praised as a "world leader in the field of mineral reactivity and biomimeralogy" and a pioneer who "has combined key advances and development of new techniques at the atomic level with major insight into large scale processes including the long-term evolution of biominerals systems."

Patricia completed her BSc. and M.Sc. studies at Virginia Tech, USA (1981 and 1984, respectively) and earned her doctoral degree from Princeton, USA, in 1991. In the past 30 years, she has built an impressively successful research career at the crossroads of mineralogy, aqueous geochemistry, biochemistry, surface physics, and environmental science—first at Georgia Tech and since 2000 at Virginia Tech. Recognizing the critical role of interaction between rocks and biota in the critical zone, Professor Dove embarked on studying some of the least-understood aspects of that interaction, including the atomic-scale kinetics and molecular dynamics of dissolution and precipitation at mineral surfaces, and focused her research efforts on biologically relevant systems (quartz, amorphous silica, calcite, and amorphous CaCO₃). She pioneered the use of atomic force microscopy (AFM) for in-situ molecular imaging to observe crystal growth and resorption under carefully controlled conditions (Dove and Hochella 1993; Dove and Platt 1996). The parameters of these experiments ranged from ambient temperature and pressure to methodologically challenging simulated environments, which required ingenious experimental apparatus, such as a hydrothermal mixed-flow reactor for direct measurements of reaction rates at steady-state conditions (Dove and Crear 1990) and fluid-tapping AFM for studying microbial interactions with minerals (Grantham and Dove 1996). This work was foundational to constraining the effects of physico-chemical parameters on the kinetics of crystal growth and dissolution, and to the development of quantitative molecular models describing these processes in surficial, hydrothermal and bio-mediated environments (e.g., Dove, 2010; Dove et al., 2008, 2019). Another important outcome of Professor Dove’s research was the collaborative discovery of crystallization by particle attachment (De Yoreo et al. 2015). This “non-classical” crystallization mechanism has since been documented increasingly in synthetic and natural systems, yielding over 170 citations of the original publication annually! These papers have far-reaching implications, not only for our understanding of how minerals form and dissolve but also for the interpretation of rock textures, paleoclimate reconstructions, evolutionary biology, and such practically important areas as nanotechnology and crystal design. Professor Dove’s outstanding contribution to science has been recognized through many awards and honors, including the F.W. Clarke Medal from the Geochemical Society (1996); Dana Medal from the Mineralogical Society of America (2014); fellowships with the Mineralogical Society of America (2000), American Geophysical Union (2008), and Geochemical Society (2010); and the US Department of Energy Best University Research Award (1999 and 2005).

Professor Dove is an award-winning educator and promoter of science, who has shared her passion for biomimeralogy with hundreds of university and school students through the National Science Foundation programs, Virginia Tech’s CurVinci Living Learning Communities, Kids Tech, and other outreach platforms. At Georgia and Virginia Techs, she has developed and taught an impressive spectrum of courses, from Resources of the Earth to Oceanography and Biomimetic Materials and Design.

We congratulate Professor Dove on this prestigious award and look forward to reading about her new exciting discoveries in biomimeralogy and beyond!

REFERENCES


MINERAL OF THE YEAR AWARD

The IMA is pleased to announce that for 2021, the “Mineral of the Year” award has been assigned to seaborgite. The mineral was found and fully characterized by a research team led by Anthony R. Kampf, from the Mineral Sciences Department of the Natural History Museum of Los Angeles County, Los Angeles, California, USA (Kampf et al., 2021).

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Figure 1. Diverging group of bladed seaborgite crystals (associated with ferrinatrite)
Seaborgite was found in the Blue Lizard mine, Red Canyon, White Canyon District, San Juan Co., Utah, USA, where it occurs on a thick crust of gypsum overlaying a matrix comprising mostly quartz. Associated phases are copiapite, ferrinatrite, ivesite, metavoltine, römerite, and other currently unknown minerals. Seaborgite occurs as attractive bladed crystals of light-yellow color up to 0.2 mm in length. Crystals typically occur in radiating sprays (Fig. 1). The ideal chemical formula of seaborgite is LiNa$_6$K$_2$(UO$_2$)(SO$_4$)$_5$(SO$_3$OH)(H$_2$O); hence, it is an uranyl sulfate mineral. Seaborgite is the only known mineral species containing both Li and U as species-forming elements, and it is also one of very few minerals containing three distinct alkali metals.

Seaborgite is triclinic, with space group P 1, and unit cell parameters $a$ = 5.4511(4) Å, $b$ = 14.4870(12) Å, $c$ = 15.8735(15) Å, $\alpha$ = 76.295(5)$^\circ$, $\beta$ = 81.439(6)$^\circ$, and $\gamma$ = 85.511(6)$^\circ$. Its crystal structure has been determined by single-crystal X-ray diffraction methods to $R = 3.77\%$. The structure of seaborgite is new and unprecedented, although it is based on the same uranyl sulfate cluster that is topologically identical to the one in the crystal structure of bluelizardite.

The mineral was named after Glenn Seaborg (1912–1999), an American chemist who was involved in the synthesis, discovery, and investigation of ten transuranium elements, including seaborgium. These studies led him to win the 1951 Nobel Prize in Chemistry.

Seaborgite is the third “Mineral of the Year” with its type locality in the USA. The previous winners were ophirite (2014, from the Ophir mine in Utah) and rowleyite (2017, from the Rowley mine in Arizona). The Blue Lizard mine was a prolific mineralogical site and the type locality for 22 other mineral species besides seaborgite.

The full description of the new mineral is available courtesy of the American Mineralogist from https://pubs.geoscienceworld.org/msa/ammin/article/106/1/105/593632/Seaborgite-LiNa6K2-UO2-SO4-5-

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Kampf AR, and 5 coauthors (2021) Seaborgite, LiNa$_6$K$_2$(UO$_2$)(SO$_4$)$_5$(SO$_3$OH)(H$_2$O), the first uranyl mineral containing lithium. American Mineralogist 106: 105-111, doi: 10.2138/am-2020-7540
Informatics, or information science, focuses on all aspects of extracting information from data. The objectives of informatics include assembling and providing access to well-curated data resources, developing and applying advanced analytical and visualization methods, and the interpretation of results after applying these methods. Open and reliable data resources that conform to FAIR (Findable, Accessible, Interoperable, and Reusable) practices are an essential pillar of scientific advances through informatics. Mineralogists have long benefited from open-access data resources such as mindat.org, rruff.info, and earthchem.org, but a significant amount of published and unpublished data on mineral occurrences, compositions, physical properties, and other attributes are not yet available on any open-access platform. Most mineralogical publications do not require new data to be deposited in an open-access form, nor are there uniform standards for reporting such data.

Accordingly, significant opportunities exist to improve the accessibility and reliability of a wide range of mineralogical data, as well as to develop and disseminate analytical and visualization methods to advance mineralogical research. We hope to start a conversation among engaged members of the community to identify needs and opportunities, to formulate best practices, to encourage a culture of data sharing among members of the Earth and planetary materials community, and to develop and share new resources.

Accordingly, Sergey Krivovichev, Shaunna Morison, Yan Li, and Robert Hazen have been asked to lead a new International Mineralogical Association called the “Mineral Informatics Working Group.” As a first step, we are developing a list of interested mineralogical community members. If you would like to receive future notices, and perhaps participate in this effort, please email Robert Hazen at rhazen@ciw.edu.