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Preface: 13th International Symposium on Crystallization in Glasses and Liquids (Crystallization 2024)

September 24-27, 2024, Orléans, France

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The articles presented in this special section follow the 13th International Symposium on Crystallization in Glasses and Liquids (Crystallization 2024) held in the historic city of Orléans, France. The web of the event is still available at https://www.lestudium-ias.com/events/13th-international-symposium-crystallization-glasses-and-liquids. The Loire Valley Institute for Advanced Studies (Le Studium) had the pleasure and honor to host this symposium, which is the thirteenth in a series of successful meetings organized by the International Commission on Glass (ICG) Technical Committee 07 (TC07), the theme of which is Crystallization in Glasses and Glass-ceramics. More information about this technical committee, and also the ICG, can be found at http://www.icglass.org/. Previous versions of this symposium have been held in the United States in 1960, 1971, 1981, 1992 and 2006, in Brazil 1996 and 2009, in Liechtenstein in 2000, in the UK in 2003, in Germany in 2012, in Japan in 2015, and in Spain in 2017. Over the years, these meetings have established a strong international reputation for disseminating the state-of-the-art in crystallization research, from fundamental aspects to innovative glass-ceramic products.

The Orléans symposium covered the areas of simulation and theory, formation, structure, properties, and applications of crystallized glasses. The number of participants in the conference was 90 and the scientific programme comprised 65 contributions, 41 lectures (including 12 invited talks) and 24 poster presentations. The international nature of the symposium was emphasized by invited speakers from Brazil, China, France, Germany, Italy, Japan, Spain, and the USA. Over all, lectures and posters were presented by representatives from eighteen different countries. The symposium provided excellent opportunities for facilitating discussion among experts focused on:

- Fundamental approaches to nucleation and crystal growth in glasses and liquids (interaction between theory, modelling and experiment) - Simulations, modelling, theory, contribution of artificial intelligence,
- Developments and novel nucleation/crystallization processes (spray melting, photo-, laser-induced crystallization, sol-gel, magnetic field induced nucleation) - Crystallisation phenomena in natural glasses/melts and amorphous materials (polymers, sol-gel, metallic glasses, thin films),
- Relationships between glass structure and nucleation - Liquid phase separation, heterogeneities - Role of nucleating agents,

- Advanced characterisation methods, techniques and characterization tools (in situ, high spatial and temporal resolution, detection sensitivity),
- Relationships between microstructures and properties of glass-ceramics (mechanical strength, transparency, chemical/thermal resistance, magnetic, electrical properties),
- New glass-ceramics and applications - Environmentally-friendly glass-ceramics.

We had the honour of welcoming the following 12 invited speakers: Prof. Eduardo Bellini Ferreira, University of São Paulo (Brazil), Dr Danilo Di Genova, CNR-ISSMC (Italy), Dr Cécile Genevois, CEMHTI-CNRS (France), Prof. Thomas Höche, Fraunhofer IMWS (Germany), Prof. Tsuyoshi Honma, Nagaoka University of Technology (Japan), Prof. John McCloy, Washington State University (USA), Dr. Maria Jesus Pascual Francisco, ICV-CSIC (Spain), Prof. Jianrong Qiu, Zhejiang University (China), Dr. Stefan Reinsch, BAM (Germany), Dr Kenji Shinozaki, AIST (Japan), Dr. Alessio Zandonà, Clausthal University of Technology (Germany), Dr. Xianghua Zhang, CNRS - University of Rennes (France).

Two oral presentations and two poster presentations were awarded by an international jury with a certificate and a gift to PhD presenters. The oral awards went to Christina Baslari from CEA, Saclay (France) for her presentation “Development of functional optical layers by integrating YAG:Ce into 316L stainless steel components” and Euan Duncan from CEMHTI-CNRS, Orléans (France) for his presentation “Glass – Crystallisation and Structural Characterisation of a New Aluminosilicate by XRD and NMR”. The two poster awards went to Priscille Fauvarque, (France) and Maciej Nowagiel (Poland). The participants enjoyed a guided visit of the old city of Orléans.

Most of the attendees described Crystallization 2024 as a great success, due to the high quality of the presentations and to the friendly and inspiring atmosphere among the participants. We wish to thank, therefore, the members of the Loire Valley Institute for Advanced Studies LeStudium for the hard work and support in the organization. We are deeply grateful to the ICG and the TC07 project for approval of the conference and the allocated financial assistance. Before starting the congress, TC07 celebrated a business meeting on Tuesday 24th September in which the next conference location was decided as Guangzhou (China) in 2027 (chairman: Prof. Shifeng Zhou). We wish him a great success!

Finally, we wish to thank all the authors of the selected papers in this special section about “Crystallization 2024” for their efforts and very valuable contributions.

Participants of Crystallization 2024 in front of the Orléans Cathedral and flyer of the Symposium.