

18th European Workshop on Modern Developments and Applications in Microbeam Analysis (EMAS 2025), Mataró, Spain, 11-15 May 2025

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This volume of the EPJ Web Of Conferences contains papers from the 18th Workshop of the European Microbeam Analysis Society (EMAS) on Modern Developments and Applications in Microbeam Analysis, which took place from the 11th to the 15th of May 2025 at the Tecnocampus center, Mataró, Spain.

The primary aim of this series of workshops is to assess the state-of-the-art and reliability of microbeam analysis techniques. The workshops also provide a forum where students and young scientists starting out on a career in microbeam analysis can meet and discuss with the established experts. The Mataró meeting was organised within the usual EMAS format, comprising invited plenary lectures by internationally recognised experts, poster presentations by the participants and round-table discussions on the key topics led by specialists in the field. EMAS2025 was organized in collaboration with the University of Barcelona, Spain. The technical programme included the following topics: Electron backscatter diffraction (EBSD); Reference materials and quality control; Micro and nanobeam analysis in the Earth Sciences; Electron probe microanalysis (EPMA) and soft X-ray emission spectroscopy (SXES); and combined techniques in SEM. As at previous workshops, there was also a special oral session for Early Career Scientists. The best presentation by an early career scientist was awarded with an invitation to attend the 2026 Microscopy and Microanalysis meeting in Milwaukee, Wisconsin. The prize went to Edgar Alejandro Cortés-Calderón, The Natural History Museum, London (UK), for his presentation entitled “X-ray mapping of volcanic groundmass glass: New insights into lithium scavenging from volcanic rock” (by E. A. Cortés-Calderón, B.S. Ellis, C. Broderick and Y. Buret). The second best presentation by an early career scientist was awarded with an invitation to attend the IUMAS-9: the 9th Congress of the International Union of Microbeam Analysis Societies, in Xi’an, China, June 31-July 3, 2026; the prize went to Sian I. Odell, The University of Manchester, Department of Materials, Manchester (UK), for her contribution entitled “Microstructural control and characterisation of Mg-Gd-Zn-Zr long periods stacking ordered

(LPSO) phase alloys” (by Sian I. Odell, J.M. Donoghue, J. Fellowes, A.E. Davis, M. Murphy and J.D. Robson).

Three half-day pre-meeting courses were held covering the following areas of microbeam analysis: Introduction to EBSD, Modelling in EPMA using Monte Carlo simulation and Boltzmann transport equation, and Advanced EPMA, and two working group meetings were devoted to Facility management and EPMA optimisation in irradiated and nuclear material analysis. The continuing relevance of the EMAS meetings and the high regard in which they are held internationally can be seen from the fact that 67 posters from 20 countries were on display at the meeting and that the participants came from as far away as Japan, Australia and U.S.A. A selection of participants with posters was invited to give a short oral presentation of their work in three dedicated sessions. The EMAS Early Career Scientist Poster Award was awarded with an invitation to participate in the AMAS XVII: the Australian Microanalysis Society's biennial symposium, February 9-13, 2026, at the Pullman Albert Park, in Melbourne. Australia. The prize was awarded to Federica Boero, Earth Sciences Department, University of Turin, Turin (IT), for her contribution entitled “Investigating garnet inclusions via EBSD: New insights into their genesis and metamorphic evolution” (by F. Boero, S. Ghignone and M. Bruno). The EMAS Workshop Poster Prize was given to Florent Lebreton, CEA, DES, ISEC, DMRC, Marcoule (France), for his poster entitled “Combining EPMA and Raman μ -spectroscopy for the characterisation of MOX nuclear fuel” (by F. Lebreton, P. Martin, L. Medyk, M. Alibert and C. Aloin). Finally, Ery C. Hughes, Earth Structure and Processes, Te Pū Ao | GNS Science, Aotearoa (New Zealand), received the Bastin PhD Thesis Award for her PhD thesis entitled: “Microanalytical techniques and experimental studies of the volatile and fO₂ history of magmas using melt inclusions”.

This proceedings volume contains the full texts of 5 of the invited plenary lectures and of 13 papers on related topics originating from the posters presented at the workshop. All the papers have been subjected to peer review by a least two referees.

Acknowledgements

On behalf of the European Microbeam Analysis Society I would like to thank all the invited speakers, session chairs and members of the discussion panels for making the meeting such a great success. Special thanks go to Xavier Llovet and Luc Van 't dack who directed the organisation of the workshop giving freely of their time and talents. As was the case for previous workshops, the EMAS Board in corpore was responsible for the scientific programme. The Workshop also included a commercial exhibition where many leading instrument suppliers were represented. Several companies that exhibited provided financial support, either by sponsoring an event or by advertising. Below, in alphabetical order, is a list of exhibiting companies and sponsors of the workshop:

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