

## The 7<sup>th</sup> European Conference on Mineralogy and Spectroscopy Preface

*The rapid advancement in technology offers new methods for performing investigations in the broad field of mineralogy. New spectroscopic techniques open frontiers in both basic science and in applied research. These range from a basic understanding of the mechanisms of structural phase transitions to the compositional effect on thermodynamic and transport properties of crystalline and amorphous natural solids, to the development of protocols for the remote-sensing detection of the presence (even in small amounts) of dangerous contaminants or of precious ores, to the explanation of unusual materials behaviour thus solving century-long debates, or to unravelling the complex history of famous gemstones. All of this incredible technical development is accompanied by more and more effective computational techniques. These are crucial for interpreting complicated experimental results at the microscopic level, and are often the only means to explore minerals and materials behaviour at conditions of the deep Earth, barely accessible or even inaccessible to experiments.*

*Following the European Spectroscopic Conferences in Rome (1988), Berlin (1995), Kiev (1996), Paris (2001), Vienna (2004) and Stockholm (2007), the 7<sup>th</sup> European Conference on Mineralogy and Spectroscopy (ECMS 2011) hosted a very rich selection of the most extensive and exciting results in the different fields of application of spectroscopy in mineralogy, together with combined experimental and theoretical studies both in basic and applied mineralogy. ECMS 2011 took place on September 4–7<sup>th</sup>, 2011, at the German Research Centre for Geosciences (GFZ) ([www.gfz-potsdam.de](http://www.gfz-potsdam.de)) of the Helmholtz Association. GFZ is an international leading institution engaged in multidisciplinary, multiscale research in Earth sciences founded in 1992. It is located within the Albert Einstein Science Park in Potsdam, originally created to host the Prussian Geodetic Institute and the Geomagnetic Observatory and continuously active as a scientific research centre since 1892.*

*The meeting was organized by a committee composed of Monika Koch-Müller (Chair), Matthias Gottschalk, Beate Hein, Hans-Josef Reichmann and Max Wilke – all members of the GFZ. Thanks to their efforts the meeting was a complete success. One hundred scientists attended ECMS 2011, representing scientific institutions from 29 countries from five continents. Ninety-two oral and poster contributions were presented during three days of intensive and exciting activity. Among these contributions were six invited keynote talks given by Anne Hofmeister (Washington University, St Louis), Sergio Speziale (GFZ), Daniele Antonangeli (CNRS, Paris), Renata Wentzcovich (University of Minnesota, Minneapolis), Michail Taran (National Academy of Science of Ukraine, Kyiv) and François Farges (Muséum national d'Histoire naturelle, Paris). Each day, a committee selected the best poster presentation by a young scientist. The awardees were P. Kristova (University of Brighton), M. Lastusaari (University of Turku) and C. Aparicio (Palacký University, Olomouc).*

*The twelve studies included in this thematic issue cover a wide range of topics in mineral sciences. Structural studies include the effects of chemical substitution in Cs phosphates (Borovikova et al.), the quantitative study of the relationship between tetrahedrally coordinated Fe<sup>3+</sup> and O distances in kimzeyite garnet (Giuli et al.), a new method to determine electric field gradients based on structural data (Lottermoser et al.), and the ordering of Al in Al-rich phlogopite (Langner & Fechtelkord). Rüscher presents important new results on the role of polarons as charge carriers in biotites. High-pressure experimental studies include the investigation of optical absorption in V<sup>3+</sup>-bearing pyroxenes (Taran & Ohashi) and of phase transitions in ilvaite (Koch-Müller et al.), and a combined computational and experimental investigation of pressure-induced hydrogen-bond symmetrization in guyanaite (Jahn et al.). Wentzcovitch et al. present a thorough state of the art review of the interpretation of pressure-induced Fe spin crossover in the major minerals of the lower mantle. This thematic issue also includes applied studies by Laukamp et al. (Remote IR spectroscopy for the identification of Ca-amphiboles) and Di Bencistá et al. (identification of covellite in Cu<sub>x</sub>S thin films). Finally, Lastusaari et al. present a successful example for the application of mineral spectroscopy to subjects related to history and cultural heritage in a study of the mechanism of luminescence of Bologna stone (BaS), thus solving a controversy that has lasted for centuries.*

*We thank all the participants for contributing to this excellent scientific meeting, and we thank the authors of the studies that compose this thematic issue. We want to express all our appreciation for the support by Chief Editor Patrick Cordier, Managing Editor Christian Chopin and Walter Maresch who enthusiastically supported and motivated us in the realization of this issue.*

*We look forward to the 8<sup>th</sup> European Conference on Mineralogy and Spectroscopy which is planned to take place in Rome in 2015, hosted by the Sapienza University.*

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