

Commission of Physics of Minerals

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Report activities 2015-2020

2015

International Meetings

8th EUROPEAN CONFERENCE ON MINERALOGY AND SPECTROSCOPY (Rome, September 9-11, 2015)

The 8th ECMS (European Conference on Mineralogy and Spectroscopy) was held in Prague in the second week of September, going on with the long tradition of this conference, held for the first time in Rome, in 1988. The 8th ECMS meeting was held under the auspices of the IMA (Commission for Physics and Chemistry of Minerals), of the EMU, of the SIMP, among others. The meeting attracted 120 participants from 19 countries across Europe, America, Asia and Australia. 6 Keynote Speakers were invited: Frank C. Hawthorne (University of Manitoba, Canada), Laurence Galois (Université Pierre et Marie Curie, France), Robert D. Shannon (University of Colorado, USA), Giancarlo Della Ventura (University of Roma Tre, Italy), Björn Winkler (University of Frankfurt, Germany), Catherine McCammon (University of Bayreuth, Germany).

Sessions in Scientific meetings.

JOINT ASSEMBLY AGU-GAC-MAC-CGU, 3-7 May

Session Title: Perovskites into the Next Millennium

Convenors: Catherine McCammon (University of Bayreuth), Anton Chakhmouradian (University of Manitoba), Patrick Woodward (Ohio State University) and Razvan Caracas (ENS Lyon)

New developments involving the perovskite structure and its many minerals and related phases continue to proliferate, among them the formal naming of the Earth's most abundant phase ("bridgmanite") found in the Tenham meteorite and the sky rocketing efficiency of perovskite solar cells. Structural modifications, crystal chemistry, phase relations, magnetism, physical and thermodynamic properties of perovskite and related structures continue to play an important role in processes occurring on the Earth and other planets. We invite contributions on all of these topics from field studies, experimental investigations and the computational community.

26th IUGG GENERAL ASSEMBLY, 22 June - 2 July

Session Title: Physics and Chemistry of Earth and Planetary Interiors with Implications for their Structure, Process and Evolution

Convenors: Catherine McCammon (University of Bayreuth), Jihua Chen (Florida International University), Ian Jackson (ANU), Sergio Speziale (GFZ), Tomoo Katsura (University of Bayreuth), Joshua Feinberg (University of Minnesota), Anne Pommier (ASU), Tilman Spohn (DLR), Ralf Greve (Hokkaido University), Michael Purucker (NASA), Catherine Constable (Scripps), George Helffrich (Bristol University), Gregory Housemann (University of Leeds)

Advances in understanding the structure and evolution of the Earth's interior typically involve a combination of insights from field-based observations, the laboratory, and modeling. An interdisciplinary symposium is planned, involving new results from seismological and electrical sounding of the structure of the mantle and core (including discontinuities, anisotropy and attenuation), observations of the Earth's magnetic field and its relationship to planetary heat-flow, related earth materials research (including phase equilibria, element partitioning, deformation and the development of texture, and the influence of volatiles on partial melting, seismic and electrical properties, and rheology), and numerical modeling of properties and processes on scales ranging from the atomic to geodynamic, and from accretion and core formation to the present.

AGU FALL MEETING

Session Title: Structure, dynamics and properties of silicate melts and magmas

Convenors D. Di Genova, D.R. Neuville, G.S. Henderson

Physical and thermodynamic properties of silicate melts and magmas are key factors governing petrological and volcanic processes such as melt generation, transport, emplacement, crystallization, degassing and eruptive style. Studying the variation of these properties as a function of chemical composition and volatile content in silicate liquids is a fundamental task to better understand the dynamics of volcanic systems and to produce numerical models for the mitigation of volcanic risks.

The purpose of this session is to describe the current state of art in our knowledge of physical and thermodynamic properties of silicate melts. For these reasons, we welcome contributions applying experimental, theoretical, numerical and innovative approaches for understanding the structure, dynamics and properties of magmas and silicate glasses and melts.

CPM business meeting at the Goldschmidt in Praha:

Discussion about next sessions in scientific meetings, and about the possibility to organize a special issue for the 40th birthday of the Physics and Chemistry of Mineral Journal. Discussion with Nancy Ross, Catherine McCammon, Eiji Ohtani, Razvan Carracas, T. Inoue and D.R. Neuville about topics. Possible topics and chapters: Simulations, Molecular dynamic and non molecular dynamic, Core, Surface, Chemical reaction at atomic scale, Surface processes up to core processes, Ice giant, satellite. Need to discuss in more detail during next AGU meeting in San Francisco during the MRP meeting, but the discussion wasn't productive, and we need to make a further discussion during next meeting in Yokohama next year.

2016

Sessions in Scientific meetings.

Goldschmidt 2016, Yokomama, 26 June-1 July

Goldschmidt Theme: Mineralogy and Mineral Physics

Chair: Catherine McCammon (Bayreuth, Germany). Co-chairs: Masaki Akaogi (Gakushuin University, Japan), Matthew Kohn (Boise State, USA)

Minerals are the main building blocks of all that is solid in the known universe. They are sensitive to physical, chemical, and biological processes and are hence the primary recorders of past history on Earth, the planets and beyond. Mineral structures, chemistry and properties hold the key to deciphering the nature of the Earth and planets and the processes that made them what they are today as well as what they may become in the future. Sessions in this theme showcase recent developments that span the range of experimental, theoretical and field studies in mineralogy, crystal chemistry and mineral physics of both natural and synthetic phases.

Session Title: Glasses and Melts: From Volcanos to Laboratory

Convenors: Daniel R. Neuville, Roberto Moretti

Information concerning the structure and properties of silicate glasses and melts is indispensable for quantitative descriptions of glass making and also magmatic processes and modelling the differentiation processes of "magma oceans" in the early Earth. This session is intended to bring together the latest research reports on the structure and physical/thermodynamic properties of silicate glasses and melts. The topics may include, but are not restricted to: i) spectroscopic studies of the structures of silicate glasses and melts using techniques such as NMR, IR, Raman and EXAFS; ii) experimental measurements of physical properties, such as viscosity, density, diffusivity, and elemental partitioning; iii) computational studies such as molecular dynamics simulations and ab initio calculations.

Session Title: Mineral Physics of the Earth's Interior: Constraints on the Chemistry and Physics of our Planet from Experimental and Computational Studies

Convenors: Catherine McCammon, Razvan Caracas, Ryosuke Sinmyo, Vincenzo Stagno, Tetsuya Komabayashi, Jun Tsuchiya, Xianlong Wang

Recent progress on the physics and chemistry of crystal structures at extreme conditions as well as extraordinary advances in computational material science techniques such as first principles calculation methods provide new insight to geochemical and geophysical problems, for example that the deep Earth may host novel oxides, silicates and carbonates whose stability relations can influence geophysical observables and geodynamics of the Earth's mantle at variable depths. The direct correlation between crystal structure and electronic state of transition elements dominantly controls the elasticity, transport properties and element partitioning of the mineral phases under pressure. In addition, the recent finding of new iron-bearing oxides with exotic stoichiometry implies a re-evaluation of possible redox equilibria and, in turn, melting relations within mantle assemblages. This session invites contributions on 1) the chemistry and physics of minerals under high pressures and high temperatures based on both experimental and theoretical studies, 2) electronic state and its effect on physical properties, 3) redox equilibria within terrestrial assemblages involving new phases and available thermodynamic data, 4) geodynamic and ab initio modelling as a tool to provide insight into the deep Earth and provide guidance for future research in mineral physics. We encourage discussions of methodological development toward better modelling of geochemical and geophysical processes such as isotope fractionation, the determination of transport properties, and so on.

EMC2016 Rimini 11-15 September

Session Title: "News from the deep Earth and beyond".

Conveners: P. Comodi (Università di Perugia, Italy), C. McCammon (University Bayreuth, Germany), T. Inoue (Ehime University, Japan).

Description: How the Earth's engine works and how it may evolve in the future depends on the nature of minerals and related phases at depth and their response to changes in pressure, temperature, fluid compositions and so on. The knowledge of HP-HT mineral physics is hence fundamental to our understanding of properties and processes within the Earth's interiors and more generally for the study of planetary bodies. This session will present a snapshot of current research, particularly focusing on experimental results of both natural and analogue phases that shed new light on our understanding of the Earth and planetary interiors.

CPM business meeting at the Goldschmidt in Yokohama: 28 June

1) The discussion about the possibility to make a special issue for the 40th birthday of the Physics and Chemistry of Mineral Journal continued with C. McCammon, T. Inoue, R. Moretti, E. Ohtani, D.R. Neuville. Several topics are listed and need to be discussed during next meeting in Rimini during EMC, in September.

Recent developments for

- Synthesis methods
- Numerical simulations (MD, first-principles calculation, etc.)
- Extreme condition experiments (high pressure, high temperature, etc.) ,
- Analysis methods
- Physical properties measurements

Which can be the 2 guest editors? What topics do we choose?

2) A proposition from the CPM of IMA to organize a Magma and melts under extreme conditions, by Danilo Di Genova (Munich), Simon C. Kohn (Bristol) and Daniel R. Neuville (Paris) was rejected by the president of the french mineralogical society (SFMC).

CPM business meeting at EMC2016 in Rimini-11 September 3:30-5:00

Order of Business:

1) activities for next IMA meeting:

Session proposals for coming IMA

2) Activities for other meetings and conferences related to CMP.

2017 JpGU-AGU joint meeting Chiba, Japan 20-25 May 2017 Goldschmidt Paris 13-18 August 2017 EMPG?

3) Special Issue 40th birthday of the Physics and Chemistry of Mineral Journal.

Definition of Topics and Guest editors

2017

Sessions in Scientific meetings.

Goldschmidt 2018, Paris, Paris 13-18 August.

Sessions: Linking the Redox State of Silicate Melts to Magmatic Processes: R. Moretti and Neuville D.R.

Understanding the redox state of terrestrial materials is extremely important for constraining and advancing our knowledge of the formation and evolution of the Earth. Redox is one of the keys to understanding the oxygenation of the Earth and magmatic processes from magma genesis, through crystallization to volcanic degassing. Furthermore, redox affects the properties of materials, and research bridges between materials science and Earth sciences. It is well known that the oxidation state of iron can produce important changes in macroscopic properties like viscosity. More generally, redox can affect the formation and structure of silicate melts and glasses, nucleation and growth of crystals, and degassing of volatiles. The redox ratio of a redox variable element can also be used to determine the oxygen fugacity of a system and potentially of the source region. Recently, new tools have been developed and refined to determine the oxidation state of redox variable elements in silicate melts and glasses. These include partitioning experiments, Raman spectroscopy, X ray Absorption Spectroscopy, Mossbauer spectroscopy, EELS, and the electron microprobe based "flank method". These advances in experiments and theory are revealing new insights into the atomic structure and macroscopic properties of silicate glasses and melts, the evolution of magmas, and processes operating at spreading centres

and subduction zones. The objective of the session is to stimulate discussion of the links between atomic scale structures, macroscopic properties, and magmatic processes in the Earth (and other planetary bodies).

Project of AGU book: Moretti R., and Neuville D.R. (2020) Magma Redox Geochemistry. AGU Monograph Series.

2018

Sessions in Scientific meetings.

IMA Melbourne:

Sessions: Structure and Properties of Silicate Glasses and Melts: From Laboratory to Volcanic Activities :
Conveners: Cormier L, Neuville D.R.

Information concerning the structure and properties of silicate glasses and melts is indispensable for quantitative descriptions of glass making and also magmatic processes and modelling the differentiation processes of “magma oceans” in the early Earth. This session is intended to bring together the latest research reports on the structure and physical/thermodynamic properties of silicate glasses and melts. The topics may include, but are not restricted to: i) spectroscopic studies of the structures of silicate glasses and melts using techniques such as NMR, IR, Raman and EXAFS; ii) experimental measurements of physical properties, such as viscosity, density, diffusivity, and elemental partitioning; -iii) computational studies such as molecular dynamics simulations and ab initio calculations.

Sessions: Latest Developments in Synchrotron-based Studies in Mineralogy, Petrology and Geochemistry :

Conveners: L Galois, Henderson G.S.

The purpose of this session is to examine the diverse applications of synchrotron-based techniques to mineralogical, petrological and geochemical problems. Recently, research in geosciences has benefited greatly from new generations of synchrotron sources across the world. The development of these facilities has led to dramatic improvements in time resolution, data quality, detection limits and spatial resolution. This allows great improvements of the knowledge on the structure and composition of the bulk and surface of minerals, glasses and melts. We solicit submissions that have employed methods and techniques that require the high intensity and flux of synchrotron radiation sources in mineralogy, petrology and geochemistry: XAS (XANES, EXAFS, HERDF...), XRF, X-ray microscopy (e.g. STXM), tomography, scattering methods (e.g. SAXS/WAXS), x-ray diffraction, inelastic scattering, IR spectroscopy... In particular, we encourage presentations of studies of μ -size samples, in-situ studies at high T/P, time-resolved measurements, and determination of structure/property relationships.

CPM business meeting at Melbourne 15 August 2018 at 16:15

Participants:

D.R. Neuville, E. Othani, P. Comodi, C. McCammon, T. Irifune, H. Ohfuji, T. Inoue, G.S. Henderson

A discussion begins on the activities that should be developed in order to increase the activity and the visibility of our commission.

Catherine Mc Cammon,CMC, invites the commission to suggest more activities in the next future. Up to now the members have organized several sessions in several meetings and conferences as it was described in the report, but it should be important to try to organize some events with the sponsorship of the commission.

DRN proposes that for the future when a CMP member propose a session or theme in AGU, EGU, Goldschmidt congress he mention that this event is supported by the CMP commission of IMA in the proposal of the session. Moreover, to follow one of the mission of the commission, namely to disseminate this sector of the geosciences and try to approach young researchers to this topic, DRN suggests to organize a school or a workshop on some specific themes as satellite event of the next IMA 2022 conference in France.

After a large discussion, where all attending persons intervene, the very preliminary idea is taken into account: CMP workshop July 15-16, 2022, Lyon ENS

Topic: Recent advances in methodologies for mineral physics, focusing the attention on Raman, Brillouin and Mossbauer spectroscopies

When: just before IMA meeting (17-22 July 2022)

How Long: 2 days, with one day on theoretical aspects and one day with practice and visit to the labs (IMPIC and IPGP).

The participants to the present meeting consider this as a starting point, organized at the present meeting, but other ideas, suggestions, problem or comments from other members are welcome.

Next meeting of the commission may be at EMC-2020 in Krakow or/and at next Goldsmith conference in Barcelona 2019.

The members and the activity of the commission should be added to the IMA web pages, and so the secretary will be in contact with the IMA secretary.

2019

International Meetings

9th EUROPEAN CONFERENCE ON MINERALOGY AND SPECTROSCOPY (Prague, September 11-13, 2019)

The 9th ECMS (European Conference on Mineralogy and Spectroscopy) was held in Prague in the second week of September, going on with the long tradition of this conference, held for the first time in Rome, in 1988. The meeting represents the most relevant occasion, at the European level, to let converge scientists from all EU, but very often from abroad, to an event fully dedicated to the integration of mineralogical studies with the numerous (and always different) spectroscopic techniques. The program of the ECMS meetings lets the delegate to face for three days with a comprehensive view of the state-of-the-art themes in mineral spectroscopy. The 9th ECMS meeting was realised under the auspices of the IMA (Commission for Physics and Chemistry of Minerals), of the EMU, of the SIMP and of the editor Springer. The meeting attracted 109 delegates, most from 14 countries across Europe, but someone coming from Canada and US (from North America), Australia, and Myanmar (from Asia).

Here below some numbers of the event:

- ✓ Total number of presentations: 96 (48 oral presentations, 48 posters)
- ✓ 6 Keynote Speakers: Peter C. Burns (University of Notre Dame, USA), Janice Bishop (SETI Institute, USA), Sergey V. Krivovichev (St. Petersburg State University, Russia), Anna Vymazalová (Czech Geological Survey, Czech Republic), Juraj Majzlan (Friedrich Schiller University Jena, Germany), Sergey S. Lobanov (GFZ Potsdam, Germany).
- ✓ Fellowships assigned to young delegates

Sessions in Scientific meetings.

AGU San Francisco:

Sessions: Oxygen Fugacity and Redox Mechanisms in High- to Low-Temperature Geochemical Processes

Conveners: R. Moretti, Aulbach S., Planavsky N.

Redox is one of the keys for understanding Earth oxygenation, magmatism and volcanism, from magma-genesis, through crystallization to volcanic degassing. Furthermore, redox plays a fundamental role for material processes: its understanding allows bridging important gaps between material and Earth sciences. The objective of the session is to promote the links between atomic-scale structures, macroscopic properties, and igneous processes occurring on Earth.

We strongly encourage the submission of contributions about the role of redox on:

- i) melt/glass thermodynamics with emphasis on mixing properties (including first principles approaches)
- ii) spectroscopic evidence for short-medium range structure
- iii) role of cationic and anionic interactions on transport properties
- iv) volatile solubility and diffusivity
- v) speciation behavior, with emphasis on volatiles and trace elements
- vi) glass transition and rheology of magmas
- vii) experimental and computational determination of phase diagrams, particularly in volatile-bearing systems
- viii) reconstruction of igneous processes from backtracking of redox data in natural samples

AGU session "Redox variables and mechanisms in magmatism and volcanism" organized by Roberto Moretti and D.R. Neuville

2020

Sessions in Scientific meetings.

Goldschmidt 2020, Hawaii

Sessions: Magmas and Melts: Their Role in Igneous Processes

Conveners: Henderson G.S., Neuville D.R.

Since the early 70's Bjorn Mysen of the Geophysical Laboratory at the Carnegie Institute of Washington DC, has worked extensively in areas related to high temperature and pressure behavior of melts and the role melts play in Igneous processes. He has made many outstanding contributions to experimental petrology especially in: 1) The relationship between melt structure and property relations; 2) Phase relations in mantle materials, fluids in melting processes; 3) the properties and structure of melts and glasses; 4) element partitioning between minerals and 5) fluids and melts at high temperatures and pressures. We encourage submission of abstracts in any of these areas.

This session will be postponed to Goldschmidt 2021 in Lyon

EMC2020

Sessions: Mineral physics and planetology: a journey across the universe.

Conveners: Comodi P., Dubrovinsky L. and Othani E.

This session will be postponed to EMC2021.

JpGU-AGU joint meeting 2020: July 12-16, 2020 (Virtual meeting)

Sessions: S-IT24 Magma and fluid transport in the Earth's interior

Conveners: Bjorn Mysen, Eiji Ohtani, Zhao Dapeng, Michihiko Nakamura

The principal mass and energy transport agents in the Earth's interior are magma and fluids. The objective of the proposed session is to combine experimental data, observations, and theoretical modeling to describe the transport properties and processes. Melting, crystallization, and devolatilization occur across temperature intervals within which the distribution of mass between melts, fluids, and crystals is established. Element partitioning between melts, crystals, and fluids is needed to describe these processes. Physical properties of melts and fluids are controlled by their chemical composition, temperature, and pressure. The mass transfer processes depend on the property information. Magma aggregation at depth and ascent toward the surface are direct functions of density contrasts and permeability and depends on temperature, pressure, chemical composition and concentration of volatile components. The mass transfer processes are imaged globally and locally by geophysical observations such as seismic tomography and electrical conductivity profiles. The proposed session will focus on those phenomena including laboratory experiments, numerical modeling, and observations using geophysical, seismological and geochemical approaches. These include physical and chemical properties and process of magma and fluid, near surface processes of volcanic eruptions, and geophysical imaging of various scales from locally to globally. Contributions to any of these subjects are encouraged.

Sessions: S-IT31: Planetary cores: Structure, formation, and evolution

Hidenori Terasaki, Eiji Ohtani, Gerd Steinle-Neumann, William F McDonough

There are fundamental links between the formation and evolution of planets and their satellites to that of their cores both in terms of magnetic field generation and chemical and physical structure. Defining physical and chemical properties of the cores and core materials of these terrestrial bodies are therefore fundamental for understanding their internal structures and thermal profile. Recent advances in experimental and theoretical studies provide new insights into the Earth's cores and other terrestrial bodies, including the role of light elements in the early history of planets and at current times. Recent, current and future space missions have and will continue to obtain data on the internal structure of terrestrial planets (e.g., Mars and Mercury) and planet-satellite systems. We anticipate presentations on recent advances on the physical and chemical properties of cores and discussions regarding the latest views of their formation and evolution. We welcome contributions from mineral/rock physics, geophysics, geochemistry, geodynamics, and planetary science.

Goldschmidt 2020, Honolulu (Virtual conference)

Session 13d: Airborne Particles and Fibers: Characteristics, Sources, Toxicology, and Impacts on Ecosystems and Human Health

Conveners: Francesco Di Benedetto, Elena Belluso, Peggy O'Day, Janice Brahney

Keynote: Reto Gieré (University of Pennsylvania)

Respirable airborne particulate matter (PM), fibers and particles < 10 µm, pose a major health risk and affect ecosystems worldwide. Historically, studies of health impacts, risk assessment, and policy and regulatory measures have focused on dimensional features (e.g., PM or fiber size) and on occupational exposure type. Particles and fiber emissions arise from a variety of natural and anthropogenic sources and activities, often in combination, that include a diversity of combustion, abrasion, and erosion processes. Knowledge of chemical

and isotopic composition, geometric characteristics, element speciation and bonding, mineralogy, chemical and physical correlations, and organic and inorganic associations in airborne PM and fiber mixtures determines our ability to identify sources and modes of deposition, and to understand adverse health impacts and element cycling in aquatic and terrestrial ecosystems. Fundamental understanding of PM and fiber chemistry, diffusion, and toxicology can contribute to risk assessment and air quality modeling that informs public health advisories and actions, and to biogeochemical, aquatic, and vegetation models aimed at quantifying ecosystem responses. This interdisciplinary session invites contributions from geosciences (geochemistry, mineralogy, petrology), atmospheric and materials sciences (chemistry, physics), health sciences (biology, toxicology, public health), and policy and regulatory agencies on: the chemical, mineralogical, and isotopic nature and characteristics of airborne PM and fibers; links between their chemistry, geometry, dispersion, toxicology, and human health; impacts on ecosystems and biogeochemical cycles; and applications of geochemical knowledge and risk assessment to inform public health response, air quality management, and policies for better safeguards of environmental and human health.

MSE 2020 Darmstadt 22-25 September, 2020 (virtual meeting)

Session F03: Characterization of Energy Materials

Conveners: Francesco Di Benedetto, Susan Schorr

Energy materials, i.e. materials designed to efficiently operate in the field of energy conversion and storage, are nowadays attracting an increasing interest for the reduction of the dependence of the global energetic metabolism from the fossil fuels. Efficient materials, devices, attention to the health and environmental issues, sustainability of the material production and improvement of its durability (in a cradle-to-gate approach) are all issues strictly connected to a deep and accurate structural, chemical and spectroscopic characterisation. Materials properties need to be linked to phase and chemical materials composition, as well as to their homogeneity, to their morphology and to their surface features.

This symposium welcomes contributions open to all characterisation methods, being particularly devoted to lateral resolution, in situ/operando, synchrotron based techniques. Theoretical and/or thermodynamical comparison of characterisation studies will be also considered.

Publications activities.

Periodico di Mineralogia (2015) Proceedings of the 8 European Conference on Mineralogy and Spectroscopy Rome, Italy, September 9-11, 2015.

Edited by Giovanni B. Andreozzi and Ferdinando Bosi

A special issue of the journal including the abstract of all the oral and poster presentations held at the 8th ECMS international meeting.

European Journal of Mineralogy (2015) volume 28 number 3

Guest Editors: Giovanni B. Andreozzi, Ferdinando Bosi, Francesco Di Benedetto

A special issue of the Journal including original papers on topics presented at the 8th ECMS international meeting.

ELEMENTS Volume 16, Number 3 (June) THE REDOX ENGINE OF EARTH

Guest Editors: Roberto Moretti (IPGP, Guadeloupe), M. Rita Cicconi (IPGP, France) and Daniel R. Neuville (IPGP, France)

The redox state is one of the master variables that drove the formation of the Earth and that now also controls life processes. From the dawn of geochemistry, a knowledge of redox states has been essential to understanding the compositional makeup of our planet and the fundamental processes that occur in any natural chemical system, from the core to the atmosphere, from magmatic systems to aquatic systems. The social and economic impact of redox geochemistry is enormous because of the control it plays on metal mobility, solubility, metal availability and any associated complexing ligands, and the widespread use of redox indicators for environmental hazard assessment. This issue of Elements will illustrate how understanding redox processes can help us to understand much of Earth's activity.

<http://elementsmagazine.org>

AGU Monograph

Magma Redox Geochemistry December 2020

Guest Editors: Roberto Moretti (IPGP, Guadeloupe) and Daniel R. Neuville (IPGP, France)

Review in Mineralogy and Geochemistry

Magma, melts, liquids and glasses: Experimental insights

Guest Editors: D.R. Neuville, G.S. Henderson and D.B. Dingwell.

Journal of Geosciences, volume 65 (2020), issue 1

Special issue: Papers arising from the 9th European Conference on Mineralogy and Spectroscopy

Guest editors: František Laufek, Jakub Plášil, Jan Cempírek and Radek Škoda

A special issue of the Journal including 6 original papers on topics presented at the 9th ECMS international meeting.

FUTURE ACTIVITIES of CPM 2021

Sessions in Scientific meetings.

Goldschmidt 2021, Lyon

Sessions: Magma and Melts: Their Role in Igneous Processes

Conveners: Henderson G.S., Neuville D.R.

Short course on Magma, melts, liquids and glasses: Experimental insights

Conveners: D.R. Neuville, G.S. Henderson and D.B. Dingwell

IPGP Paris July 10-11

Sessions: Inorganic particles and elongate mineral particles (EMP), interaction with the biosphere, and risk assessment

Conveners: Francesco Di Benedetto, Terri-Ann Berry, Elena Belluso, Ruggero Vigliaturo

EMC2021

Sessions: Mineral physics and planetology: a journey across the universe.

Conveners: Comodi P., Dubrovinsky L. and Othani E.

JpGU 2021 meeting June 3- June 6, 2021 (On-line)

Sessions: S-IT18: Planetary cores: Structure, formation, and evolution

Conveners: Hidenori Terasaki, Eiji Ohtani, William F McDonough, Attilio Rivoldini

There are fundamental links between the formation and evolution of planets and their satellites to that of their cores both in terms of magnetic field generation and chemical and physical structure. Defining physical and chemical properties of the cores and core materials of these terrestrial bodies are therefore fundamental for understanding their internal structures and thermal profile. Recent advances in experimental and theoretical studies provide new insights into the Earth's cores and other terrestrial bodies, including the role of light elements in the early history of planets and at current times. Recent, current and future space missions have and will continue to obtain data on the internal structure of terrestrial planets (e.g., Mars and Mercury) and planet-satellite systems. We anticipate presentations on recent advances on the physical and chemical properties of cores and discussions regarding the latest views of their formation and evolution.

We welcome contributions from mineral/rock physics, geophysics, geochemistry, geodynamics, and planetary science. We also welcome papers stimulating an interdisciplinary collaboration relating to establishment of the Study of Earth Deep Interior (SEDI)-Japan community.

Sessions: S-IT20: Magma, Fluid transport and Seismicity in the Earth's interior (Joint session with AGU)

Conveners; Eiji Ohtani, Saeko Kita, Michihiko Nakamura, and Bjorn Mysen

The mass transfer depends on properties of the Earth's materials and geodynamic processes including cold slab subduction and magmatism due to hot plume activity. The mass transfer processes are imaged by geophysical observations such as seismic tomography and electrical conductivity profiles. One of the most important

processes to transport volatiles is the slab subduction. The degree of hydration and dehydration in the slab is essential to evaluate amounts of volatiles transported into the deep mantle. Hydration and dehydration in the slab directly related to slab earthquakes, deformation of the slabs, and the arc magmatism. The fate of the fluid dehydrated in the deep slab is also a debated issue since permeability at the depth may be small, and the fluid might be trapped in the slabs and transported in the deep earth's interior at that depths without escaping to the mantle wedge. Recent seismic tomographic studies of the slab revealed direct observations of hydration and dehydration sites in the slabs. The proposed session will focus on those phenomena including laboratory experiments, numerical modeling, and geophysical and geochemical observations including physical and chemical properties of magma and fluid, and geophysical imaging of various scales including seismic tomography of the descending slabs, and monitoring of near surface processes of volcanic eruptions. Contributions to any of these subjects are encouraged. We also encourage papers stimulating an interdisciplinary collaboration relating to establishment of the SEDI-Japan community.

2022

Sessions in Scientific meetings.

IMA Lyon

CMP workshop July 15-16, 2022, Lyon ENS

Topic: Recent advances in methodologies for mineral physics, focusing the attention on Raman, Brillouin and Mossbauer spectroscopies.