

Activity Report of the Commission on Physics of Minerals (CPM) (2018-2022)

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The Commission on Physics of Minerals (CPM), established within the International Mineralogical Association (IMA), is dedicated to facilitating the integration of the latest knowledge in solid-state physics and materials science into a wide variety of mineral studies through the organization of workshops, conferences, and publications. Reports on IMA-CPM activities will be regularly published in the journal *Physics of Chemistry of Minerals* (PCM)^{1,2}.

This activity report describes: 1. Activity in 2018-2022, 2. the subsequent restructuring of the CPM; 3. the IMA Board's evaluation of the CPM in 2021 and its corresponding proposed improvements, and 4. the CPM's future activity plans.

1. Activity in 2018-2022

During this period, the CPM consisted of 24 members, including Daniel R Neuville (Chair), Toru Inoue (Vice-Chair) and Paola Comodi (Secretary). In the IMA 2018 General Assembly in Melbourne, the CPM held discussions to explore ways to enhance its activity. Additionally, the workshops organized by the CPM were planned during this event. Unfortunately, many subsequent meetings were cancelled or postponed after 2020 due to the pandemic. Nevertheless, CPM sponsored sessions of the following meetings between 2018 and 2022:

IMA 2018 (Melbourne), ECMS (Prague), AGU 2019 (San Francisco), JpGU-AGU 2020 (Virtual), Goldschmidt 2020 (Hawaii, Virtual), MSE 2020 (Virtual), JpGU 2021 (Online), Goldschmidt 2021 (Virtual), EMC 2021 (Krakow), AGU 2021 (New Orleans), JpGU 2022 (Chiba), IMA 2022 (Lyon), AfSL2022 (Johannesburg, virtual). Also, several proceedings and reports associated with these meetings have been published.

2. Reorganization of CPM

During the discussions at the 23rd General Assembly of the IMA 2022 in Lyon and subsequent Committee meetings and discussions, the CPM was restructured, and its activities were reviewed. The majority of the Committee members concluded that despite the limitations imposed by the pandemic, the CPM's work remains significant and should continue its activities.

(1) New Executive Committee

The new structure, with Paola Comodi as Chair, Jun Tsuchiya as Vice-Chair, and Sujoy Ghosh as Secretary, was approved through voting in October 2022. It will be formally approved in August 2024

during European Mineralogical Conference (EMC 2024), which will be held in Dublin.

(2) Review of sub-commission

To reduce the burden on individual committee members, the CPM has established sub-commission according to the areas of expertise of its members. The current structure is as follows.

- a) Earth Deep Interior (6: Comodi, Ghosh, Inoue, Reynard, Bass, Ohtani)
- b) Spectroscopy, diffraction and new instrumentations in mineral physics (4: Di Benedetto, Dubrovinsky, Amthauer, Ohfuji, Cardon)
- c) Glass and melt studies and their applications to geosciences and industry (7: Neuville, Henderson, Moretti, Lee, Behren)
- d) Theoretical and computational mineral physics (3: Prencipe, Karki, Tsuchiya)

3. Response to the evaluation of CPM by the 2021 IMA

An assessment of CPM's activities over the past six years was made by the IMA's Council. Two major recommendations for future activities were made. The first recommendation is to enhance visibility, and the second is to improve activities and services. Based on these recommendations, the following action plan has been formulated:

(1) Improve visibility

(a) Active participation in various conferences and other events, and clearly indicating sponsorships
CPM will ensure that its sponsorship is clearly stated whenever possible in sessions involving CPM committee members so that CPM's activities make themselves evident in appropriate advertisements and on the website. Recently, CPM sponsored a session at EMPG-XVIII (Mineral Physics), and three sessions in JpGU 2023 which will be held in May 2023 (S-IT16: Deep Earth Sciences, S-IT17: Transport Processes and Properties in the Earth, S-IT18 Planetary cores: Structure, formation, and evolution).

Also, CPM participated in the virtual joint meeting of the AfLS and AfPS 2022 in November 2022. Presentations were made by commission members to highlight the importance of mineral physics research and emphasized the significance of the African Synchrotron Radiation Facility in mineralogy. The CPM also invited Yuji Higo (Japan Synchrotron Radiation Research Institute) to present a plenary talk during the CPM sponsored session titled "Current status and future plans of BL04B1/SPring-8". We also proposed a session in EMC 2024 Dublin (Conveners: Paola Comodi and Jun Tsuchiya, session title: Recent challenges and advances in theoretical and experimental mineral physics).

(b) Submit reports to the IMA Board of Directors on a regular annual or biennial basis and post them on the CPM page on the official IMA website, as well as establishing a dedicated CPM website (to include activities introducing research methods and theories related to the International Mineralogical Year activities and mineral physics, and online educational materials).

(c) We have set up group emails for CPM members and Executive members.

(2) Improvement of activities and services

(a) Ensuring Diversity of Committee Members

As described in 2. (1) and (2), the CPM committee members were reorganized. However, the percentage of female members decreased from 18% (=5 members) to 11% (= 2 members) due to the reorganization of committee members (however, the chair and vice chair are female). For the future, the CPM aims to recruit more female committee members and participation from China, Africa and South America.

(b) Review of sub-commission

As described in 2. (2), sub-commissions were established. In the future, it will be necessary to further promote the division of labor by assigning a chair/vice-chair in each commission.

4. Future Prospects

Increasing the gender and regional diversity of committee members, planning a special issue of PCM (the official journal of the CPM), and regular publishing activity reports are particularly important, also by improving the commission's web page on IMA's website

Currently, a gradual shift in the focus of mineral research is occurring from the elucidation of static mineral properties to the understanding dynamic behaviors, therefore, the role of CPM is becoming even more important. The missions of CPM should be redefined and shared among the committee members to promote structural reform and division of labor.

References

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2. E. Ohtani, Report of the IMA commission on the Physics of Minerals 2011-2014, *Physics of Chemistry of Minerals*, 41, 487, 2014, doi:10.1007/s00269-014-0688-7.