

IUPAP Commission on Semiconductor Physics (C8) Report on Activities in 2021/2024

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The IUPAP C8 commission covers the semiconductor field. Its main activities include overseeing the most prestigious and largest semiconductor conference, namely ICPS (International Conference on the Physics of Semiconductors) and awarding Early Career Scientist Prizes (ECSP). The 35th and 36th editions of the ICPS conference were held successfully during the commissions 2021-2024 tenure in Sydney, Australia (2022) and Ottawa, Canada (2024). In addition to the usual issues that come with organizing major conferences, the commission and conference organizers dealt both with specific challenges related to the lingering consequences of the Covid virus and consequences of the current political atmosphere which led to delays in the granting of Visas for participants. It should be noted that the question of whether conference participation for large conferences such as ICPS will return to pre-Covid levels is not yet fully resolved.

The chair of the commission (Prof. Young Dong Kim) worked closely with the other members of the commission secretariat (secretary Dr. G. Platero and vice chair Dr. Andy Sachrajda) throughout the period. This was achieved via frequent email discussions, Zoom meetings and a business lunch. All commission members were briefed about IUPAP issues as they arose and were involved in choosing the early career scientist prizes (a competition run by the commission secretary). In addition, every year at the major conferences sponsored by the commission (alternatively at ICPS and EP2DS) annual commission meetings were held in person with an on-line option to discuss relevant issues. All commission members were encouraged to provide their opinions.

The major meetings and decisions made by the commissions were as follows.

- (a) Once the new commission was elected at the 2021 GA, the past chair (Prof. Rolf Haug) and the new chair-elect (Prof. Young Dong King) held an on-line meeting for all members of the old and

new commission tenures. This provided an opportunity for the new members to learn about IUPAP and their responsibilities.

- (b) The 2022 Early Career Scientist Prize competition was held with extremely high-quality nominees. The two award winners were,

Prof. Dmitri K. Efetov
Chair of Experimental Solid State Physics, LMU Munich

Prof. Deep Jariwala
Assistant Professor of Electrical and Systems Engineering
University of Pennsylvania, Philadelphia, USA

- (c) As a result of Covid, the 2020 ICPS conference was delayed for two years and held in Sydney, Australia in 2022 from the 27th June to the 30th June 2022. The C8 meeting was held on the 28th June at the conference with an online option. Prof. Sven Rogge, as the organizing chair, made a presentation regarding the conference status. As expected, the number of participants was greatly reduced compared to pre-Covid years but the organizers' heroic effort was rewarded with a highly successful scientific conference. Due to ICPS2020 being delayed for two years, the two winners of ECSP 2020 (Profs. Cheng Gong & Michael Saliba) had the opportunity to give their invited talks at the conference together with the 2022 winners Profs. Efetov and Jariwala. The chair of C8 also noted that a previous C8 Young Scientist Prize recipient Prof. Heejung Yang in KAIST, Korea would make a presentation at the IUPAP centennial meeting held in July 2022. Reports were presented concerning preparations for the 2023 EP2DS conference (Grenoble) and the 2024 ICPS (Ottawa). It was confirmed that the 2026 ICPS would be held in Japan with Prof. Arakawa as the conference chair.
- (d) The EP2DS/MSS (Electronic properties of 2D systems/Modulated Semiconductor Structures) conference was held from 9th to 14th July 2023 in Grenoble, France. It provided the venue for the 2023 C8 commission meeting. The EP2DS/MSS Chair, Prof. Milan Orlita, reported that the conference numbers were as expected and gave a presentation on the conference status. He emphasized that the financial support from the IUPAP was very helpful not just symbolically confirming IUPAP approval but in a substantial way. Reports were also given on the preparations for the future 2024 ICPS conference in Ottawa and the 2026 conference in Japan. The organizers for the 2026 conference decided to move the conference to Tokyo from Yokohama for logistical reasons. The commission also decided to add Park Systems, which became a Corporate Associate Member of IUPAP in 2023, as an associate member of C8. After a long and serious discussion concerning whether one of the ECSP awards should be reserved for a female physicist, the commission decided to keep the current scoring system in place at least for the time being, focusing only on the quality of the candidates' research activities.
- (e) The Early Career Scientist Prize was run in late 2023 and early 2024. As in previous rounds the quality of candidates was exceptional. The two award winners were

Prof. Yang Xu of Institute of Physics, Institute of Physics, Chinese Academy of Sciences

Prof. Marina Filip, Dept. of Physics, University of Oxford, UK

Both winners gave plenary style invited talks at the ICPS meeting in Ottawa, although Dr. Xu's talk was recorded due to Visa application delays.

- (f) The 2024 C8 commission meeting was held during the ICPS meeting in Ottawa on Thursday 1st August 2024. Prof. Hawrylak described some of the issues the local organizing committee faced. This included a lower-than-expected number of participants likely due to the lingering effects of Covid, which resulted in significant hotel attrition charges and delays in Visas for scientists (especially from China and Russia). The latter caused some participants to miss the conference. The chair congratulated Prof. Hawrylak and the organising committee on a successful scientific conference in spite of these challenges. A report by Prof. Arakawa concerning the 2026 ICPS in Japan confirmed that good progress was being made with preparations for the conference. No proposals had been received, however, for the 2028 ICPS conference which for this edition should be held in Europe. The chair challenged the commission members to help solve this by early October by contacting likely candidates in Europe. Potential interest to hold the conference in Madrid was being investigated. A new member list was thoroughly discussed and finalized to be recommended to the IUPAP GA in October. A candidate from Belgium received more support than one from Poland but the commission agreed to gladly accept any decision made on this at the GA. For the first time, the C8 budget was discussed at the commission meeting. The accumulated C8 annual budget surplus was decided to be transferred to Ottawa ICPS organizing committee to restore our tradition of donating the surplus amount from the previous ICPS organizer to the next organizer. Until now ICPS organizers provided lunch boxes for C8 meeting participants but in the future the C8 budget will be used for the lunch boxes. The Intel donation (~25K Euro) has not previously been utilized, since ICPS organizers themselves arranged the poster awards. However, from this year C8 will support travel expenditures for ECSP winners to the tune of 500CHF from the Intel fund. The first recipient will be Prof. Filip. The C8 budget will also be used to support banquet tickets for C8 members who attend the ICPS to encourage their personal attendance at the C8 annual meeting during ICPS. It was unfortunate that the organizer of EP2DS 2025 had not been decided, which meant that we could not apply for IUPAP conference support for it due to the 1 June deadline.