

AMD Unit: Future Activities

Joint IAEA-ICTP Workshops

Proposed Workshop on Radiation Damage in Nuclear Systems: from Bohr to Young

- 2-weeks, in-person at the ICTP in 2023(?); in cooperation with NDS-NDSU
- <https://amdis.iaea.org/workshops/ictp-2020>
- Emphasis on the conceptual progression of theoretical and experimental techniques across spatial scales from atomistic descriptions to the macroscopic behaviour of bulk material.

Directors (2020 proposal)

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Kalle Heinola (IAEA)

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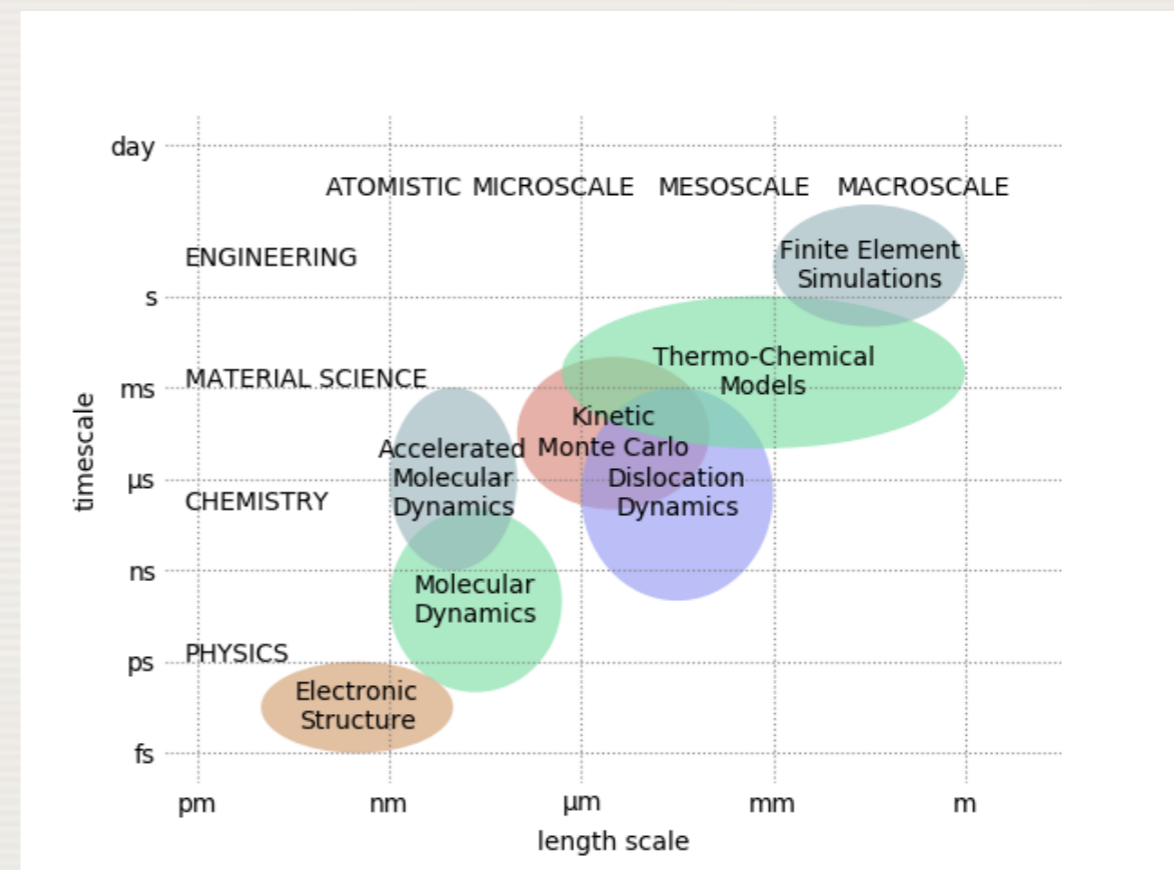
Wolfgang Jacob (IPP-Garching, Germany)

Sabina Markelj (Jožef Stefan Institute, Slovenia)

Jean-Christophe Sublet (IAEA)

Gary Was (University of Michigan, USA)

Steven Zinkle (University of Tennessee, USA)



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Upcoming Meetings (2022 – 23)

- Consultancy Meeting on the Evaluation of Data for Neutral Beam Modelling, 18 – 20 May 2022 (hybrid)
- Steering Committee Meeting of the Women in Fusion network, 24 – 25 May 2022 (ITER, Kalle to attend)
- Preparatory Consultancy Meeting for the Injected Impurities CRP, 7 – 8 June 2022 (hybrid)
- First Research Coordination Meeting of the Injected Impurities CRP, 5 – 7 October 2022 (TBC)
- Third Research Coordination Meeting of the Vapour Shielding CRP, 19 – 21 October 2022 (TBC)
- Second Research Coordination Meeting of the Hydrogen Permeation CRP, 28 – 30 November 2022 (TBC)
- Consultancy Meeting of WG3 for W/H in Edge Plasmas TM Series
- Atomic Processes in Plasmas Conference, 15 – 19 May 2023
[Combined with the biennial DCN meeting]
- 8th Code Centres Network Meeting, Autumn 2023 (TBC)

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Atomic Processes in Plasmas Conference

- To be held at the IAEA, 15 – 19 May 2023
- Sponsorship: *Atoms?*
- Combined with the 27th Data Centres Network Meeting
- Session on Tungsten and Hydrogen in Edge Plasmas
- Tutorial / Workshop afternoon (TBC)
 - Astrophysical Plasmas
 - Fundamental Data and Modelling
 - Atmospheric and Medical Plasmas
 - High Energy Density Plasmas
 - Low Temperature and Industrial Plasmas
 - Magnetically-Confined Fusion Plasmas
 - Measurements of Atomic Processes
 - Powerful Light Sources (XFEL, etc.)
 - Small-Scale Plasmas (table-top lasers, EBITs, etc.)
 - Warm Dense Matter
- <https://conferences.iaea.org/e/apip>



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Crowdsourcing “Challenge” Activity

- Machine-learning in plasma physics: application to fundamental atomic data
- Use ALADDIN evaluated dataset (~20 000 collisional cross sections) and CollisionDB “published” dataset (100 000+ cross sections)
- Envisaged challenge “solutions”:
 - Anomaly detection
 - Clustering
 - Data reduction
 - Regression of unknown cross sections
- To run Q2-3 2022; prize: €5000.

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South American Workshop / School on Nuclear Fusion Energy Physics

- Centro Atómico Bariloche, Argentina in April 2023
- Grants to Latin American participants through an IAEA cooperation agreement
- Joint project with the Physics Section (Sehila González de Vicente)
- Breakout meeting of the Women in Fusion Network
- Relevant research programmes in Argentina, Brazil, Chile, Costa Rica, Mexico
- Similar School organized in Costa Rica in 2019
- ~~Involvement of TC?~~
- Involvement of KFE through Practical Arrangements?
- Involvement of ICTP-SAIFR?

Overview of AMD Unit Activities

Conference and Workshop Cooperations

- 12th International Conference on Atomic and Molecular Data and Their Applications (ICAMDATA 2022), Bari, Italy: 25 – 29 September 2022
- Spectral Line Shapes in Plasmas 6 (SLSP 6), Hyères, France: 17 – 21 October 2022
- MoD-PMI – FZJ, May 2023 (TBC)

AMD Unit: Future Activities

Coordinated Research Project: Formation and Properties of Molecules in Edge Plasmas

Objective

The establishment of a trusted repository of evaluated data concerning the molecular species, particularly metal and nitrogen hydrides, relevant to the diagnostics and safety assessment of fusion energy reactors.

- To be submitted to CCRA for RCM1 in 2023
- Issues:
 - Metal and nitrogen hydrides (and isotopologues) in edge plasmas
 - Ab initio calculation of missing data (properties and production through physical sputtering)
 - State-resolved modelling of collisional and spectroscopy processes of molecules
 - Curating and evaluating large volumes of state-resolved data
 - Integrating molecular data into modelling codes; validation and uncertainty quantification

AMD Unit: Future Activities

The next biennium (2024 – 25)

- CRPs x2
- Decennial Meeting (Helsinki?)
- New Workshops / Schools
- Technical Meeting Series?

Recommendations

- Duty Travel
- Staffing
- IFRC Subcommittee Terms of Reference / Membership