Call for Contributions

Submission:
1. Inform the Chairs: with the Title of your Contribution
2. Submission URL:
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Please select Track Preference as **IrraDMicMac**

Special track

IrraDMicMac: Irradiation Dynamics from Microscopic to Macroscopic World

Chairs and Coordinators
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along with

ICQNM 2018, The Twelfth International Conference on Emerging Security Information, Systems and Technologies
September 16, 2018 to September 20, 2018 - Venice, Italy
http://www.iaria.org/conferences2018/ICQNM18.html

Irradiation of matter, namely energy deposition by radiation, such as by lasers or charged particles, is a fundamental scientific issue where microscopic mechanisms (down to electronic level) directly impact the macroscopic world. The dynamics of irradiation is by nature far off equilibrium, involving ionization, electron transport and large correlation effects. Irradiation also covers a multitude of time scales from the microscopic ones up to even human ones. It correlatively covers an impressive range of applications (radiation damage) from biology/medicine (oncology) to our everyday life invaded by electronic devices, miniaturization making them increasingly sensitive to radiation.

In all cases (oncology/proton therapy and in electronic devices) the key issue is to understand microscopic mechanisms, for improving dose delivery in medical applications and for reducing it in circuits, with the rapidly growing problems of soft errors (linked to increasing miniaturization) and the many issues in on-board electronics from planes to cars and cell phones. While both domains differ macroscopically, they involve comparable microscopic mechanisms making microscopic studies generic and compulsory to go beyond the macroscopic (insufficient) macroscopic "dose" concept.

Modelling is, correlatively, heavily fragmented with simulations addressing disconnected time/spatial scales. Macroscopic simulations (covering most requests up to recently) rely on Monte Carlo methods based on macroscopic rate equations such as in Geant4. In turn, state of the art microscopic simulations can only handle up to hundreds of active electrons below 1 ps (10^{-12}s) and are thus bound to about 1nm - 1ps (not simultaneously). This is orders of magnitude below relevant scales for biological/electronic applications (above 10 nm - 10 ps). It represents at least a 100000 gap (volume, constituents) between today's quantum computations and realistic applications, thus well beyond a mere computational effort. In between these two extremes, there are various approaches applicable to limited time/size ranges, thus making coupling between the various scales a major challenge. The need for approaches bridging the gap between the quantum domain and relevant applications is thus obvious.

Topics include, but not limited to:

- Irradiation dynamics
- Multiscale modeling
- Nanometer electronic devices
- Soft errors
- Monte Carlo methods
- Real-time simulations
- Radiation Damage
- Defect formation
- Cascades

Important Datelines
- Inform the Chair (see Contacts below): as soon as you decided to contribute
- Submission: ~~June 1~~ July 10
- Notification: ~~July 2~~ July 30
- Registration: ~~July 16~~ August 10
- Camera ready: ~~July 22~~ August 10

Contribution Types
- Regular papers [in the proceedings, digital library]
- Short papers (work in progress) [in the proceedings, digital library]
- Posters: two pages [in the proceedings, digital library]
- Posters: slide only [slide-deck posted on www.iaria.org]
- Presentations: slide only [slide-deck posted on www.iaria.org]
- Demos: two pages [posted on www.iaria.org]

Paper Format
- See: http://www.iaria.org/format.html
- Before submission, please check and comply with the editorial rules: http://www.iaria.org/editorialrules.html

Publications
- Extended versions of selected papers will be published in IARIA Journals: http://www.iariajournals.org
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Paper Submission
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Registration
- Each accepted paper needs at least one full registration, before the camera-ready manuscript can be included in the proceedings.
- Registration fees are available at http://www.iaria.org/registration.html

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