

WORKSHOPS

Workshop	Title	Organizer names & e-mails	Duration
WS1	Pulsed electric fields: a multi-level view from molecular interactions to medical treatments	Caterina Merla, Maura Casciola, caterina.merla@enea.it casciolamaura@gmail.com	Full day

Description: This workshop aims to introduce the URSI GASS attendees to the potentialities of the use of pulsed electric fields (PEFs) in the ms, μ s and ns time scale with high amplitude (from few kV/m to tens of MV/m) for the manipulation of cells and tissues to promote promising biomedical applications. These signals are proved to be biologically effective and their application needs to be supported at research and industrial level. Description of electric (E) pulse interaction at the molecular level will be proposed during the workshop as well as continuum methods to quantify the induced transmembrane potential following the application of exogenous E fields on single cells (microdosimetry) or cell aggregates (mesodosimetry). Biological results demonstrating the role of PEFs in in vitro and in vivo models will be also offered. These outcomes are key aspects for an aware exploitation of pulse technology in medical treatments whose examples will be provided in the field of neuronal stimulation, immune responses, and cancer ablation.

Structure: The workshop, providing a multi-level view of pulsed electric fields (PEFs) research and applications, will embrace the participation of highly qualified speakers. First, presentations oriented on molecular level interactions based on molecular dynamics simulations will be planned as well as single cell or multi-cellular continuum modelling of the physical cascade of events that PEFs induce. Secondly, new ad-hoc technologies for PEFs application in vivo, in vitro and in patients will be presented. These technological advancements increase the efficiency of PEFs delivering and enhance the local effects.

Then, in vitro and in vivo studies, dealing with different aspects involving for example cancer stem cells targeting and modulation of calcium signalling will be described. Finally, specific applications for remote targeted stimulation using the so-called cancellation of cancellation (CAN-CAN) paradigm will be presented together with studies on immune-therapy mediated by electric pulses and application of electric pulses for effective cancer ablation. The workshop content and scope will be introduced by the chairs. Common discussions will be promoted by a final round table on the different arguments treated during the workshop.

The workshop appears a well-participated event involving high level speakers and potentially a large audience spanning from PhD students to young early career investigators as well as senior researchers. The interactivity will be promoted by the chairs to support networking activity among attendees and new contributions coming from the different URSI commissions to advance in the exciting application of PEFs application in biology and medicine.

WS2 Characterization and Mitigation of Radio frequency interference: CANCELLED

Session	Title	Organizer names & e-mails	Duration
WS3	Radio science in space weather	Iwona Stanislawska, Patricia Doherty, stanis@cbk.waw.pl , Patricia.Doherty@bc.edu	Half day

Description: Radio emissions for many years have been operative tools for analysis, interpretation and identification phenomena called generally space weather. More recently, instruments such as LOFAR can give new views at many phenomena and support wider understanding of others. Particularly, radio diagnostic capabilities prove its high efficiency in remote, but as well in-situ planetary exploration. Knowledge of space weather conditions is fundamental for enabling high quality and reliable operation of radio systems within near-Earth environment and beyond. Knowledge of effects imposed by the space weather on current and new generation operational radio systems is necessary. This workshop, jointly organized by URSI Commissions GHJ, is devoted to the novel radio science tools for space weather, radio science in planetary exploration and radio science challenges for space weather services.

Structure: Three Panels of experts, including 3 invited presentations in total, and related open discussion towards the three topics that are:

- **NEW RADIO SCIENCE TOOLS FOR SPACE WEATHER**

The aim of this panel is to bring together the scientists using new arrays for space weather purposes (e.g. radio astronomers) and space weather scientists, who may be unfamiliar with the capabilities of these new instruments, to discuss how they can best be used to advance space weather science, and to discuss how these instruments and dedicated space weather instrumentation can best support one another in their respective goals.

- **RADIO SCIENCE CHALLENGES FOR SPACE WEATHER SERVICES**

Knowledge of effects imposed by the space weather on current and new generation operational radio systems, the development and implementation of techniques to mitigate the deleterious effects of the space weather on such systems are the primary scientific goals. The main issue to discuss within this panel is the generation of the novel directions for services to approach current and future radio science challenges.

- **RADIO SCIENCE IN PLANETARY EXPLORATION**

Since the start of the space venture fifty years ago, the interest of the effects of the space weather on the space missions and human exploration has strongly raised. Among the many diagnostic capabilities, radio experiments have proven to be very efficient both for remote and in-situ exploration. The aim of this panel is thus to bring together researchers from planetary and interplanetary past and future missions as well as engineers from radio domains to discuss the results of recent missions (like Mars Express) and address the results foreseen by the future, Solar Orbiter, Parker Solar Probe or Juice.

Session	Title	Organizer names & e-mails	Duration
WS4	Women in radio science	Micaela Liberti, Alessandra Costanzo micaela.liberti@uniroma1.it, alessandra.costanzo@unibo.it	2H

Description: *“The empowerment of women and the establishment of gender equality are crucial to democracy. Not only the form of institutions determines the quality of democracy, but also by the extent that different social groups participate in these institutions”.* VALENTINE M. MOGHADAM, *Professor of Sociology and International Affairs, College of Social Sciences and Humanities, Northeastern University, Boston.*

Science and gender equality are both vital for the achievement of the internationally agreed sustainable development goals and for the society as whole. Starting from this concept and taking into account that the percentage of women involved in science and technology is growing but still lesser in respect to the men, the event “Women in Radio Science” is proposed with the following main aims: 1) celebrating the work of worldwide recognized female scientists in Radio Sciences, 2) putting a spotlight on the challenges that women scientists faced during their careers through stories that the invited speakers will tell us. Both men and women are warmly invited. This event will benefit in particular students and early career researchers by stimulating their future work and reinforcing their conviction in doing research and aspire to high-level positions in industries and academia.

Following a brief introduction by Representatives of Associations devoted to promote gender balance in Science, representatives of several URSI Commissions will showcase their research and challenges faced to the attendees. A round table will allow questions and discussions moderate by conveners.

Structure:

PART I: 10 minutes – Welcome by the conveners and general talk

PART II: Examples of careers in Radio Science;

5 invited talks of 20’ each

PART III: ROUND TABLE, Wrap UP: 10 minutes