

Preface

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The Italian Society for Radiation Research (SIRR) is an interdisciplinary scientific society that aims to promote the progress of scientific research in the field of radiation, both ionizing and non-ionizing. SIRR includes physicists, biologists, chemists and physicians, and organizes its National Conference every two years. A few months before the 19th National Conference, which was planned to take place in Cefalù, one of the most beautiful Sicilian cities, the rapidly developing Covid-19 pandemic led to the decision to cancel the face-to-face event. In the interest of the research community, it was decided to move the conference online, from 10th to 12th November 2020, while trying to preserve as much of the real-life experience as possible. Moreover, to encourage the participation of young researchers at the Conference, the SIRR decided to make 30 grants available for younger researchers who wished to participate in this event.

The Conference was held in a fully live mode to simulate a face-to-face event as much as possible, and this gave the opportunity to scientists of different disciplines to share and discuss recent data and findings, including relevant physical and biological basic mechanisms of the radiation action and their consequences for risk assessment, recent technical developments in radiation detection and novel irradiation techniques.

The scientific sessions of the Conference program included invited keynote lectures and selected oral and poster presentations. The Conference was attended by 106 participants, including many young researchers, all actively contributing to the scientific sessions.

The meeting was opened by a keynote lecture by M. Durante (GSI, Darmstadt, Germany), who discussed the biomedical research opportunities offered by new particle accelerators, including the FAIR facility that is under construction at GSI; the rest of the conference was organized in six sessions. In the first one, which was dedicated to space radiation, V. La Regina (NanoRacks Space Outpost Europe, Turin, Italy) provided an overview of the next challenges related to human space exploration, for which there is a renewed interest also due to the Artemis program, which aims to perform a new human mission to the Moon. The second session, opened by L. Manti (University of Naples “Federico II”), who analysed the main aspects of the new frontiers in protontherapy, was devoted to the mechanisms governing the induction of different biological effects at molecular, cellular and supra-cellular level. Session 3 was dedicated to non-ionizing radiation, which was discussed by A. Polichetti (ISS, Rome), also related to the mis-information that may circulate in the media. The clinical applications of ionizing radiation were presented in Session 4, where C. Messa (University Milano Bicocca) analysed the new frontiers in imaging diagnostics, whereas I. Fazio (Casa di Cura Macchiarella, Palermo) explained how artificial intelligence represents a new frontier for adaptive radiotherapy. Session 5 was dedicated to dosimetry and radiation detection; in particular, L. Raffaele (teacher for the AIFM School of Physics in Medicine) discussed the main characteristics of the radiation detectors used in hadrontherapy. The issues related to radiation protection were analysed in the last session, which was opened by P. De Felice (ENEA-Casaccia, Rome), who presented the ENEA-MiSE program for the reliability of ionizing radiation measurements.

Concerning the posters, prior to the Conference all researchers presenting a poster were asked to submit a short video presentation which was uploaded to the conference website in advance. Furthermore, seven thematic “rooms” were created for the poster sessions, in order to allow the participants to intervene and discuss about topics of interest.

The online event ran smoothly and was much more enjoyable and successful than expected. Attendees constantly followed the conference sessions, and the virtual poster “rooms” represented a place to meet and discuss on specific topics.

At the end of the Conference, young researchers were awarded for the best oral and poster presentations.

Special thanks are due to all the invited speakers for their brilliant and stimulating keynote lectures and to the chairpersons for their kind and efficient handling of the Conference sessions. Thanks also to the speakers, the poster presenters and the authors of the papers for the quality of their work.

Special thanks are also due to Mrs. Cristina Compagno and all the staff of “M.T.B. Management of Tourism and Biodiversity”, Rome, Italy, for the relevant support and assistance in the organization and management of the online event.

The first-time organization of an online conference is a complicated matter, especially under tight time constraints. In our case, a great effort of coordination was needed and a task force (formed by the people co-authoring this preface and the M.T.B. staff) made the executive decisions and carried out the required work. We were delighted to receive positive feedback about the online Conference from the attendees and the keynote speakers, and to observe the inspiring community spirit that developed during its course.