Editorial Foreword

In the final version of Issue 53 of the Superconductivity News Forum, we have included a total of thirteen presentations made at the Coated Conductors for Applications (CCA 2023) conference celebrated in Houston (USA) in April 2023 and one presentation from the American Physical Society (APS) March meeting held in Las Vegas (USA) in March 2023.

The first CCA presentation is a Plenary Talk given by Dr. Mark Bird from the National High Magnetic Field Laboratory in Florida (USA) who reviews the state of the art of the use of coated conductors (CCs) in building ultra-high magnetic field magnets. The other nine presentations are Invited Talks.

The first invited presentation was delivered by Dr. Alex Usoskin, from Renaissance Fusion (France). He presents a new approach to fabricate HTS coils without using tapes, i.e., by direct deposition on wide metallic surfaces. The presentation was made in the Compact Fusion session.

The second included invited presentation was made by Dr. Danko van der Laan, from Advanced Conductor Technologies (USA), in the Magnet Applications session. The talk includes the progress in using CORC cables in high field magnets for compact fusion and particle accelerators.

The third invited talk was delivered by Dr. Teresa Puig, from the Institute of Materials Science of Barcelona (ICMAB-CSIC, Spain), in the Conductors Materials Research session. The talk reviewed the advances in the development of CCs by Transient Liquid Assisted Growth (TLAG), a high throughput approach.

The fourth invited presentation was given by Dr. Xavier Obradors from ICMAB–CSIC (Spain), in the Conductors Materials Research session. The aim of the presentation was to show a practical way to customize existing CCs to enhance the Normal Zone Propagation Velocity to protect them in quench events.

The fifth invited presentation was given by Dr. Judy Wu from University of Kansas (USA) in the Conductors Materials Research session. The talk reported the advances on understanding the role of nanorod pinning centers analyzing multilayer films.

The sixth invited presentation was given by Dr. Boris Maiorov from Los Alamos National Laboratory (USA) in the Electromagnetic and Electromechanical session. The talk described how a pulsed magnetic field facility can be used to investigate the non-linear transport properties.

The seventh invited presentation was given by Dr. Luca Bottura from CERN (Switzerland) in the Magnet Application session. The talk reviewed the potential of using HTS magnets in the new concept of muon collider and included a prospective of the required new developments.

The eighth invited presentation was given by Dr. Sergey Lee from Faraday Solutions (Japan) in the Conductor Manufacturing session. The talk was focused on the recent advances of the company on the production of CCs as well as the prospective for future increase in the production rate.

The ninth invited presentation was given by Dr. Yanagi from National Institute for Fusion Science (Japan) in the Compact Fusion session. The presentation included a wide analysis of the potential of using STARS conductors in the new advanced compact fusion installations.

The tenth invited presentation was given by Dr. Zhai from Princeton Plasma Physics Laboratory (USA) in the Compact Fusion session. The presentation included a detailed overview of the requirements of the conductors for the different magnets of compact tokamaks.

The eleventh invited presentation was given by Dr. Yamada from Shanghai Superconductor Technology (China) and Chubu University (Japan) in the Conductor Manufacturing session. The talk included a review of the main challenges of the company concerning CC manufacturing and the plans in Japan to advance in compact fusion R&D.

The twelfth invited presentation was given by Dr. Iijima from Fujikura (Japan) in the Conductor Manufacturing session. The presentation reviewed the advances made in his company in the production and characterization of high performance CCs made by PLD.

We expect to include several additional presentations from CCA 2023 in the next SNF Issue.

The presentation from the APS March meeting was given by Dr. J.X Lin from Brown University (USA) with the title “Diodic order in graphene multilayers,” and it includes a nice example of a superconducting diode effect.

Additional contributions to the Issue 53 are two obituaries of great scientists in the field of High Temperature Superconductivity (HTS) in whom we owe gratitude for their valuable and transformative contributions.

The first tribute is to Dr. K. Alex Muller, the discoverer of HTS materials who was awarded the Physics Nobel Prize in 1987. After his death on 9th January 2023, the obituary was written by Prof. Annette Bussmann-Holder (Max Planck Institute for Solid State Research, Germany) and Prof. Hugo Keller (University of Zurich, Switzerland).

The second In Memoriam pays tribute to Dr. George W. Crabtree, a highly influential scientist from Argonne National Laboratory (USA) who strongly contributed to the understanding of vortex matter in HTS materials. He received the Kamerlingh Onnes Prize for these studies. In addition, he was active and held several commitments in Energy Storage Research. He died on 23th January 2023, and the obituary was written by his collaborator Dr. Wai K. Kwok (Argonne National Laboratory, USA).

The issue highlights several awards and recognitions presented to several scientists at different recent conferences (CCA 2023, ICMC 2023 and EUCAS 2023).

We hope that you will find the content of this SNF 53 issue informative and interesting.

Xavier Obradors and the SNF Editorial Team