

We are pleased to present Issue No. 55 of the Superconductivity News Forum

This issue includes 18 presentations made at four conferences: the 6th European Conference of Applied Superconductivity (EUCAS 2023) celebrated in Bologna (Italy) (<https://eucas2023.esas.org/>), the IRadiation Effects on HTS for Fusion (IREF 23) workshop celebrated in Arona (Italy) (<https://www.superfusion.org/iref23/>), the International Symposium in Superconductivity (ISS 2023) celebrated in Wellington (New Zealand) (<https://iss2023wlg.jp/>) and the Asian Conference on Applied Superconductivity and Cryogenics / International Cryogenic Materials Conference in Asia (ACASC 2023) (<http://www.acasc-2023.com/>). Four additional presentations made at EUCAS 2023 were already published in SNF Issue No. 54, while those made at IREF 23, ISS 23 and ACASC 23 are new to SNF Issue No. 55.

We also include in this issue the highlight paper entitled “Development of the First Tesla Class Iron-based Superconducting Coil Tested in 20 T Background Magnetic Field” by H. Ding et al. Please also give your attention to a concurrent announcement of the News press release “Origin Quantum Computing Unveils 72-Qubit Quantum Computer”.

The six new presentations made at the 16th European Conference of Applied Superconductivity (EUCAS 2023) celebrated in Bologna (Italy) were invited talks and they are the following: From the Materials program we have a talk from Dr. Pedro Barusco entitled “Customizing coated conductors to enhance normal zone propagation velocities”. From the Large Scale program, we have two talks, one from Dr. Yasuyuki Shirai entitled “Superconductivity and Hydrogen – the perfect wedding” and a second one from Dr. Joffre Gutiérrez entitled “REBCO coatings for high- energy physics applications under high magnetic fields”. Finally, from the Electronics program, we have three presentations: one from Dr. Lixing You entitled “Superconducting strip photon detectors and quantum applications”; the second one from Dr. Olivia Chen entitled “Recent Progress on Neuromorphic Computing Using Adiabatic Josephson Devices”; and the third one from Dr. Simone Gasparinetti and entitled “Autonomous, thermally-driven reset of a superconducting qubit based on a quantum absorption refrigerator”.

From IREF 23 we include six invited talks covering most of the topics included in the workshop. The first is one is from Dr. Valentina Corato, and the title is “Overview on the research and development of HTS conductors and irradiation studies within the European DEMO project”. The second one is from Dr. Xavier Obradors, and the title is “Microstructural landscape and vortex pinning scenarios in REBCO coated conductors prepared at high growth rate”. The third one is from Dr. Stuart Wimbush, and the title is “The light side and the dark side of irradiation”. The fourth one is from Dr. Susannah Speller, and the title is “X-ray absorption spectroscopy as a tool for characterizing irradiation damage in REBCO coated conductors”. The fifth one is from Dr. Gregg Brittles and the title is “HTS fusion magnet development and irradiation considerations”. Finally, the sixth one is from Dr. William Ilife and the title is “STEP’s plan for understanding REBCO coated conductors in the Fusion Environment”.

From ISS 23 we include the plenary talk delivered by Prof. Robert Hadfield entitled “Superconducting Photon Detectors: Past, Present & Future”. We also publish the invited Materials talk delivered by Prof. Iijima entitled “High-Rate and Homogenous Production of BMO-Doped REBCO Coated Conductor by IBAD and Hot-Wall PLD Process.”

From ACASC 23 we include in this issue three plenary presentations and one invited presentation. The plenary presentations are those from Dr. Shirabe Akita “Recent Progress of Superconductivity and Cryogenic Engineering in Japan and Future Prospects as Key Technologies for Realizing Carbon Neutral Society”, from Dr. Tripti Sekhar Datta “Current Activity on Applied Superconductivity and Cryogenics in India” and from Dr. Qiuliang Wang “Progress of High Field Superconducting Magnets in China”. The invited presentation is from the Materials category and it was delivered by Dr. Difan Zhou with the title “Advance in Artificial Pinning of MOD-REBCO Superconducting Coated Conductors”.

We hope that you will find the content of SNF Issue No. 55 informative and interesting. Remember to periodically check back to the site for continuous updates and announcements.

Xavier Obradors and the SNF Editorial Team