



Preface

**Marco Faverzani¹ · Elena Ferri¹ · Andrea Giachero¹ · Angelo Nucciotti¹ ·
Andrei Puiu² · Monica Sisti³**

Published online: 2 April 2020

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This Special Issue of the Journal of Low Temperature Physics contains original contributions to the *18th International Workshop on Low Temperature Particle Detectors (LTD-18)*. The conference was co-hosted by Università di Milano-Bicocca and Istituto Nazionale di Fisica Nucleare (INFN) and took place from July 22, 2019, to July 26, 2019, in Milano, at Palazzo Lombardia (headquarters of the Lombardia region) in the Directional Center of Milano. The event had a record attendance of 437 participants from 17 countries with 120 students.

The International Workshop on Low Temperature Detectors (LTD) is the biennial meeting where experts from all over the world meet to share and discuss latest results and new ideas in the field of low-temperature detectors and their applications. Low-temperature detectors with their outstanding characteristics enable unconventional methods for high-precision measurements. Their unique and promising features led to rapid technical developments in the last years, which made these detectors very attractive in a wide variety of fields from fundamental research to applied sciences. Astronomy and astrophysics, dark matter, nuclear and particle physics,

✉ Angelo Nucciotti
angelo.nucciotti@mib.infn.it

Marco Faverzani
marco.faverzani@mib.infn.it

Elena Ferri
elena.ferri@mib.infn.it

Andrea Giachero
andrea.giachero@mib.infn.it

Andrei Puiu
Andrei.puiu@gssi.it

Monica Sisti
monica.sisti@mib.infn.it

¹ Dipartimento di Fisica “G. Occhialini”, Università di Milano-Bicocca, Piazza della Scienza 3, 20126 Milano, Italy

² Gran Sasso Science Institute, Viale Francesco Crispi 7, 67100 L’Aquila, Italy

³ Istituto Nazionale di Fisica Nucleare, Sezione di Milano-Bicocca, Piazza della Scienza 3, 20126 Milano, Italy

X-ray material analysis, thin films, semiconductor and superconductor applications, ion spectroscopy and biomolecule mass spectrometry are now major research areas. Technologies commonly exploited by LTD-18 scientists include cryogenics, cryo-electronics, thin-film deposition, superconductivity, nano- and micro-fabrication, signal readout multiplexing, data acquisition and data analysis. In addition to the above, the LTD community has recently and always increasingly opened to innovative applications in the field of the quantum technologies, thereby contributing to the global interest in this growing revolution.

LTD-18 featured 2 tutorials, 14 invited reviews, 19 invited oral presentations, 75 regular oral presentations and 272 posters. The selection of the abstracts and setting up the workshop program were done with the valuable support of the LTD-18 Scientific Advisory Committee. This edition of the LTD workshop once again was a detailed snapshot of the great and exciting progresses achieved in terms of detector performance, array size and multiplexing technologies. According to the distribution of the submitted abstracts, the workshop program also allocated a large number of mature and successful applications in many strategical fields.

All the invited and contributed manuscripts collected in this Special Issue were reviewed for their scientific content, form and originality by two referees. We would like to thank all the contributors and, in particular, the many colleagues who volunteered to review manuscripts. We also acknowledge the support of Springer and of Journal Editor Paul Leiderer.

The LTD-18 Local Organizing Committee is grateful to Università di Milano-Bicocca, INFN, Regione Lombardia, to the members of the LTD-18 Scientific Advisory Committee for their support to the workshop, and to our students for their enthusiastic help during the entire duration of the workshop.

We appreciate the support of our commercial sponsors (CryoConcept, Bluefors Oy., Entropy GmbH, Heidelberg Instruments Mikrotechnik GmbH, High Precision Devices, Inc., JANIS Research Company, Kiutra, Oxford Instruments Plc.), our exhibitors (Absolut System, Allectra Limited, COAX CO., LTD., Delft Circuits b.v., LOT—QuantumDesign, Polyphase Microwave, Inc., STAR Cryoelectronics) and the contributions of CAEN and IEEE Council on Superconductivity which allowed to award several prizes to young presenters.

We would like to thank the LTD International Advisory Committee, chaired by Dr. Caroline Kilbourne, for its support and directions during the workshop organization.

Finally, we wholeheartedly thank all the participants who contributed to the success of this exciting workshop.

Marco Faverzani

Elena Ferri

Andrea Giachero

Angelo Nucciotti

Andrei Puiu

Monica Sisti

on behalf of the LTD-18 Local Organizing Committee

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Elena Ferri (Università di Milano-Bicocca, Milano, Italia)
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Angelo Nucciotti (Università di Milano-Bicocca, Milano, Italia)
Andrei Puiu (Università di Milano-Bicocca, Milano, Italia)
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18th International Workshop on Low Temperature Particle Detectors (LTD-18) at Palazzo Lombardia, Milano, Italy, July 22–26, 2019