XXXII IUPAP Conference on Computational Physics

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The 32nd IUPAP Conference in Computational Physics was held online August 2–5, 2021 with organizational support from Coventry University. The Conference in Computational Physics series of meetings is held annually under the auspices of the International Union of Pure and Applied Physics (IUPAP) at international locations alternating typically between Europe, the Americas, and the Asian and Pacific regions. It covers all areas of the computational sciences with a relation to physical applications, making it the largest and leading recurrent international meeting in computational physics. Typical topics covered include statistical mechanics and complex systems, soft matter and biophysics, materials and nano-science, fluid dynamics, quantum many-body physics, quantum computing, lattice field theory, astrophysics, gravitation and cosmology, novel hardware and software, computational physics education, machine learning and algorithms as well as geophysics and porous media. The format combines plenary overview lectures with a broad range of topical parallel sessions featuring invited impact talks as well as oral contributions and poster sessions, complemented by discussion sessions.

The organisation of the 2020 meeting was given to the present group of organisers for a meeting to be held in physical presence in Coventry. It was planned for August 2020, but with the advent of the Coronavius pandemic it was decided in April 2020 to postpone the meeting to 2021 with the hope of holding it on site. We were quite confident back then that the meeting could be held face-to-face in 2021, but the virus proved to be more persistent than we had envisaged, such that CCP2021 was held entirely online. While this disappointed some, it also offered a number of opportunities to explore new forms of scientific and social interaction. We used a virtual conference centre constructed in Gather Town that included spaces for poster sessions and exhibition space for sponsors as well as many opportunities for formal and informal discussions among participants. All oral presentations were delivered on Zoom, with the vast majority of talks delivered live and a handful of pre-recorded videos. To support discussions revolving around the presentations, we also ran a discussion space on Slack with channels for each session and a common discussion forum. All oral presentations were recorded and made available to registered participants on the conference website at `https://ccp2021.complexity-coventry.org`.

The conference featured 425 registrations, with 296 fully completed, coming from a wide range of countries, with the most represented being Japan, the United Kingdom, the United States of America, Germany, India, France, Russia and China. The program consisted of 15 plenary speakers, listed below, as well as 33 invited talks, 100 contributed talks and 72 poster contributions. The scientific sessions were complemented by cultural presentations as well as the award session for the IUPAP Young Scientist Prizes in Computational Physics which for

2020 and 2021 were awarded to Zhijun Wang and Prineha Narang, respectively. In total, these contributions led to a very exciting program, and the technical setup allowed for a rather interactive meeting. Although the actual experience might not quite have matched up to that of a traditional face-to-face conference, it was felt by many that this meeting format also has its upsides as it is more inclusive, more ecological, more diverse, and more family friendly that the traditional one.

All authors of accepted contributions to the conference were invited to submit a full paper to the proceedings. These papers are collected in the present volume, covering all major areas represented at the conference and thus providing an excellent representation of where computational physics research stands today.

We would like to thank all participants of the conference, all contributors to the scientific program and all authors of papers in this proceedings volume. Finally, we would like to acknowledge support for the conference by the IUPAP, the European Physical Society (EPS), the Institute of Physics (IOP), Coventry University, Technische Universität Chemnitz, the European Physical Journal (EPJ), Computation (MDPI), Entropy (MDPI), and MapleSoft.

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