

2021 National Research Award Ceremony

ICREA Prof at ICFO Dr Maciej Lewenstein receives distinguished award in a ceremony organized by the FCRi and the Generalitat de Catalunya

June 08, 2022

ICFOnians congratulate our esteemed colleague and friend, ICREA Prof at ICFO Dr Maciej Lewenstein who last night received the **2021 National Research Prize** (Premi Nacional de Recerca - PNR) organized by the Foundation for Research and Innovation of Catalonia (FCRi) and the Government of Catalonia. The PNR is the **highest award for research excellence in Catalonia**, recognizing the researcher who has contributed significantly and internationally during their career to the advancement of a scientific discipline in any field: human and social sciences, life and health sciences, engineering and technology and experimental sciences.

In a ceremony that took place at the Teatre Nacional de Catalonia, the **President of the Generalitat de Catalunya, Pere Aragones, and the Consellera for Research and Universities Gemma Geis** presented Prof Lewenstein with this prestigious award, along with the

recipients of the National Research Award for Young Talent (ICREA Prof Jelena Radjenovi?) and awards in the categories of Scientific Patronage (Fundacio Banc Sabadell), Scientific Communication, (Barcelona Supercomputing Center), Public-Private partnerships (Centre de Visio per Computador), and Public-Private partnerships (Intel Intelligent Systems Lab).

Prof. Lewenstein is one of the **most prominent theoretical physicists working in atomic physics and quantum optics worldwide**. During the 40+ years of his professional career, he has on several occasions either opened or stimulated new ground breaking directions and even entire areas, with many of his seminal papers stimulating new experiments or prepared in collaboration with world leading experimental groups in the field. His work is best characterized as broad and wide scope.

Since the 1980s, he has worked on the **physics of ultra-intense laser-matter interactions,** through which one can generate coherent soft X-ray radiation in table-top experiments via the process of so called high harmonic generation (HHG). He formulated the quantum theory of HHG in the early 1990s resulting in most cited paper in the history of Phys. Rev. A**1**.

In parallel, his interests expanded to **many body quantum physics and theory of ultracold atomic gases** where he pioneered theoretical studies of Bose-Einstein condensation (BEC), in particular, pioneering studies of coherent excitations in BEC systems, such a solitary stable wave packets, aka solitons. **2**

Since the end of 1990s, he has been active in the area of **Quantum Information Science** where there are new applications for quantum technologies such as quantum communications, quantum metrology, and quantum computation and simulation. While the universal quantum computer remains, to date, a dream with many scientific and technological challenges, quantum computers of special purpose, aka quantum simulators (QS) can be realized in various platforms and have already made significant achievements, exhibiting quantum advantage over classical computing devices. Together with world renown colleagues, Lewenstein wrote one of the first reviews on quantum simulations with ultracold atoms.**3**

Prof Lewenstein is also a **devoted teacher** who has supervised almost 100 Diploma, M.Sc and PhD theses at various universities and departments, as well as 60 postdoctoral researchers. Many of his group members have gone on to have brilliant scientific careers, winning their own prestigious prizes and securing permanent/ tenure track faculty positions at institutions around the world.

Prof. Lewenstein is one of the elite scientists who have obtained three successive European Research Council (ERC) Advanced Grants. He has also obtained **prestigious international awards** such as the Humboldt Senior Research Award 2007, the Joachim Hertz Foundation Prize of University of Hamburg 2010, the Prize of the Polish Science Foundation 2011, the Gutenberg Research Award 2013, the European Physical Society Quantum Electronics and Optics Senior Prize 2013, Doctorate Honoris Causa University of Warsaw 2016, Physics of Quantum Electronics (PQE) Willis E. Lamb Medal for Laser Science 2016, Medalla de la Real

Sociedad Espanola de Fisica 2017, among other recognitions which position him among the leading scientists in the world.
In addition to a stellar scientific career, Prof Lewenstein is an **acclaimed jazz critic and writer**. His passion for jazz led him to publish two editions of the guide i¿½Polish Jazz Recordin s and Beyondi¿½. He also regularly writes liner notes to CD and vinyl albums and has organ zed 10 concerts of Polish and Spanish jazz musicians in Spain and in Pol nd. Congratulations Maciej on this important award that recognizes a career marked by sem nal achieveme

s. Theory of high-harmonic generation by low-frequency laser fields, M Lewenstein, P Balcou, MY Ivanov, A L'Huillier, PB Corkum, Physical Review A 49 (3), 211
2 Dark solitons in Bose-Einstein condensates, S Burger, K Bongs, S Dettmer, W Ertmer, K Sengstock, A Sanpera, ... , Physical Review Letters 83 (25), 5198
3 Ultracold atomic gases in optical lattices: mimicking condensed matter physics and beyond M Lewenstein, A Sanpera, V Ahufinger, B Damski, A Sen, U Sen; Advances in Physics 56 (2), 243-379

