# Preface

This book holds a compilation of chapters in many exciting and rapidly developing areas of optics and photonics, a discipline that continues to enable fundamental advances and new technology touching an ever-increasing number of fields and applications.

It includes 10 perspective, 12 review and 41 research related chapters on topics as Quantum Optics, Quantum Computing, QED, Fundamental of Optics, Topological Photonics, Metamaterials, Plasmonics, Spectroscopy, Lasers, LEDs, Fiber Optics, Optical Sensors, Opto-electronics, Integrated Photonics, Flat Optics, Optimization Methods and Biomedical Photonics.

Among the list of scientists that authored these chapters, you will find one by Nobel Laureate Dr. Shuji Nakamura, co-authored with Dr. C. Weisbuch and Dr. Y-R Wu, and Dr. J. S. Speck on "Disorder effects in nitride semiconductors: impact on fundamental and device properties – Optoelectronics and Integrated Photonics".

This book is the result of a COVID-19 benefit issue that was organised by the journal *Nanophotonics* in the Spring of 2020 at the start of the Pandemic. 60+ leading scientists in the field of Optics and Photonics were invited to contribute to this special edition, which has raised a total of Euro 136.800, that will be donated to support the COVID-19 first aid workers and people in need of medical help around the world.

The image of the COVID-19 virus on the cover of this book was kindly offered by Dr. M. Scully and his colleagues; it comes from their chapter titled "A fiber optic–nanophotonic approach to the detection of antibodies and viral particles of COVID-19". In this chapter, they provide a tutorial and a preview on the use of a variation of laser spectroscopic techniques they developed for the rapid detection of anthrax that can also be applied to detect COVID-19.

We like to express our deep gratitude to all the scientists that contributed and supported this benefit. It is inspiring to see how collectively scientists stand up for this humanitarian disaster.

We also like to thank the publisher of Nanophotonics, DeGruyter, who has been so generous to donate to charity all the proceeds from the publication charges of papers published in the *Nanophotonics* issue, as well as the many people at DeGruyter that offered their professional service to publish the journal issue and this book. We also like to thank Tara Dorian for her incredible support and being the backbone of *Nanophotonics*.

We hope you will find this book stimulating.

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