



INTERNATIONAL
YEAR OF LIGHT
2015

FOREWORD ON THE SPECIAL ISSUE ON THE SCIENCE OF LIGHT

FROM THE EDITORS

It is a great pleasure to present the last EPN issue of this year, a special double issue devoted to light as a tribute to the International Year of Light and Light-based Technologies (IYL2015). We are delighted that Dr. Luc Bergé, Chair of the Quantum Electronics and Optics Division of the European Physical Society (EPS), was willing to act as Guest Editor for this special issue. We

are grateful to him and all contributing authors for their efforts to create an attractive and exceptional issue having **Light** as its leitmotiv. We hope that the issue you now hold in your hands will provide pleasant and interesting reading.

Victor R. Velasco and Jo Hermans

FROM THE GUEST EDITOR

“Let there be a Year of Light” – With these words the Secretary General of the United Nations, Ban Ki-moon, officially launched through a video message the International Year of Light during its Opening Ceremony held in the UNESCO Headquarter in Paris, the 19th of January 2015. Light is indeed everywhere: First supplied by the sun for mankind, light is an essential vector of life, inspiration and progress, for Nature through photosynthesis as well as health and well-being, for the artists of all cultures, for reducing poverty and offering alternative sources of energy, and for inspecting and thus opening new areas in all fields of science. The International Year of Light and Light-based Technologies will have been an exceptional opportunity to engage with leaders in science, technology, culture and politics; initiate partnerships between the scientific, public and private sectors; bring knowledge to people and improving their access to information and sustainable development in all parts of the world.

Looking at this ambitious perspective, I am sincerely honoured and pleased to serve as Guest Editor for this Special Issue of EuroPhysics News dedicated to the Science of Light. All along this year the Quantum Electronics and Optics Division of the EPS has supported this tremendous event every day, through the organisation of the broadest conferences devoted to light in Europe, by attributing prestigious prizes in optics and photonics, and promoting new events for young researchers throughout the world. The Science of Light is like a white light composed of many distinct vibrating colours: One field of physics composed of several branches evolving with their own seminal discoveries. It was difficult to choose



which of them could be best selected to offer a broad state-of-the-art in optics. Limited by six feature articles, my choice is by no means exhaustive, but it gives the readers different outlooks and promising applications of light in modern branches of photonics. I also asked outstanding and world-famous authors to write these feature articles, which they willingly accepted. Therefore, you will enjoy reading the articles by Philip Russell, President of The Optical Society (OSA) on photonic crystal fibres; Jörg Bewersdorf from Yale

University on super-resolved fluorescence microscopy; Anne L’Huillier, laureate of the UNESCO L’Oréal and Emmy Noether EPS Awards, on attosecond science; Martin Frimmer and Lukas Novotny on the fascinating properties of light at the nanoscale; and Gérard Mourou, co-inventor of the chirped-phase amplification technique, Jonathan Wheeler, and Toshi Tajima, discoverer of plasma-based particle acceleration, on the next generation of ultrapowerful lasers and their future capabilities to create matter from vacuum. Last but not least, the quantum nature of light is not omitted and nicely addressed from the teleportation viewpoint by Nicolas Gisin, awarded by the John Bell Prize in 2009, Sébastien Tanzilli and Wolfgang Tittel.

I deeply thank all these great names for accepting my invitation and for their kindness in delivering their article on time. All of them contribute to pushing forward the frontiers of knowledge in the Science of Light.

So, Let there be Light!

Luc Bergé