

## **Preface to the Inaugural Issue of the Journal of Advanced Optics and Photonics**

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We welcome you to the inaugural issue of the Journal of Advanced Optics and Photonics (JAOP), a new academic publication vehicle dedicated to disseminate knowledge and promote research in the fields of Optics and Photonics, which have witnessed landscape changes over the past several decades, and undoubtedly have an extremely bright future, limited only by our imagination. Since many of important scientific and technological problems facing us today and tomorrow are fundamentally optical in nature, the photonic methods of design and characterization, which once were the province of optical specialists, have become penetrated literally every scientific field, opening doors for truly interdisciplinary research that has generated amazingly fruitful results. Yet insatiable optical specialists have come across extra miles to expand their spectrum of research by developing all sorts of new materials and applying fine-tuned micro- and nanoscale fabrication methods that have successfully led to novel and remarkable devices, systems and applications.

Proliferation and prevalence of optics and photonics can easily be attributed to a noticeable trend that the field is becoming international on all counts, from scientific research, product development, to commercialization, and alike. Without exaggeration, optics and photonics is playing its unshakable role in human progress across all the continents, rightfully reflected in 2013 by the United Nations in its declaration of 2015 as the International Year of Light and Light-Based Technologies and UNESCO's endorsement to celebrate 16<sup>th</sup> of May every year from 2018 as annual International Day of Light. Pivotal to support this international vision of photonics is relentless research endeavors, which also inspires the birth of this journal with a strong commitment to serve as an important repository for top research from every corner of the world. Targeted publications thus include high impact research papers, review articles, application notes, and new product introduction. From time to time, we shall organize topical issues in traditional and/or emerging area of choice.

The publication mission of JAOP cannot be fulfilled without proudly the hard work from its Editorial Board with distinguished members drawn from both academia and industry. Committed to high quality publication, the editors and the editorial board members are doing anything they are entitled to assure the authors a fast turn-around time, and to best meet the growing needs of readers. The first issue of JAOP was a direct result of such great efforts put forth by our editorial board members, our reviewers, and above all, our contributing authors.

In this issue, even with a quick glimpse, readers shall appreciate advances in optics and photonics through collaborative and multidisciplinary research efforts. The five papers accepted for publication touch upon wide and diverse areas of InGaAs/AlGaIn-based

optoelectronic materials, devices and optoelectronics circuits; bio-optics detection; and novel application of Virtual Reality(VR) technology. The contributions of these works are briefly summarized below.

The wide-band group III nitride semiconductor materials, such as GaN, have been extensively studied for high-power, high-temperature, high-speed, and high-efficiency applications. The paper titled “Molecular Beam Epitaxial Growth and Device Characterization of AlGa<sub>N</sub> Nanowire Ultraviolet-B Light-Emitting Diodes” demonstrates a design and fabrication method of Al<sub>x</sub>Ga<sub>1-x</sub>N nanowire ultraviolet (UV) LEDs on silicon substrate by molecular beam epitaxy. Besides the use of GaN in LEDs, GaN, AlGa<sub>N</sub>, and InGa<sub>N</sub> have been identified as the enabling material for ultrasensitive photodetector, and Ye and Li present a novel low cost, high performance InGaAs-based photoelectric conversion and amplification circuit in the paper titled “On the InGaAs-based Photodetection Circuit for Scanning Near-Infrared Signal in the Wavelength Range of 1.0-2.0 $\mu$ m”.

Optics and biology/medicine are synergized as research goes deeper into single molecular and cellular level and even beyond. On one hand, optical instrumentation for bio-imaging is shaping up the way we see, feel, and operate in biological and medical sciences. On the other, biomedical applications are critical drivers for technology development in optics and photonics. In this issue, the paper “Nematic Liquid Crystal Reorientation at Aqueous-LC Interface for Monitoring Biochemical Interactions by Specific Ions Effects”, by a group of biomedical scientists and doctors, employs nematic liquid crystal(LC) to monitor biochemistry interactions in real time. A second paper titled “Detecting cellular morphological changes through light scattering patterns: comparison of methods” examines how the scattering light to detect cellular morphological changes.

As an emerging technology with computer-generated scenarios and use of optical devices to simulate a realistic experience, Virtual Reality (VR) has extended its use in modelling and displaying in science and engineering problems. Exemplified in the paper titled “Modeling and Displaying Dust Accumulation Process on Solar Panel and Impacts on Photoelectrical Conversion in a Virtual Reality Environment”, the authors successfully employ the VR to study the impacts of dust accumulation on solar panel, in terms of dust accumulation rates and drop of photocurrent/electricity generation.

While we are wrapping up the first issue of JAOP, we have already begun reviewing and editing papers that shall appear in the next issues. In particular, we encourage to stay tuned for a review article on “Diffraction Optics” in the upcoming issue, with a focus on weight-lightening and compacted imaging systems seen in aircraft and spaceship.

Finally, we would like to take this opportunity to thank all those that have supported and contributed to the excellent start of the journal. We invite you to continue to grow with JAOP, as time goes by. Should you have any comments, feedback or suggestions that you would like to share with us, we can be reached by E-mail at [JAOP@techscience.com](mailto:JAOP@techscience.com).

***\*Editors of Journal of Advanced Optics and Photonics***