

# Introduction: nonlinear optics (NLO) 2017 feature issue

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**Abstract:** The editors introduce the feature issue on “Nonlinear Optics 2017,” based on the topics presented at the NLO 2017 conference, which was held in Waikoloa, Hawaii, USA from July 17-21, 2017. This feature issue is jointly published by *Optics Express* and *Optical Materials Express*.

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**OCIS codes:** (190.0190) Nonlinear optics; (060.4370) Nonlinear optics, fibers; (190.2620) Harmonic generation and mixing; (140.0140) Lasers and laser optics.

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The OSA Nonlinear Optics (NLO) 2017 Conference, held in Waikoloa on the Big Island of Hawaii from July 17 to 21st, was the 14th conference in this series. It has been successfully held in the state of Hawaii more or less biannually since the very first meeting on Kauai in 1990.

The meeting included a total of 165 oral and poster presentations from over 22 countries worldwide, thus providing an international forum for discussion of all aspects of nonlinear optics. Generally, these aspects fall into three categories: 1. Fundamental Studies and New Concepts, 2. Nonlinear Materials and 3. Applications, covering disruptive fields ranging from quantum nonlinear optics via photonic and nanostructures, plasmonics and metamaterials up to laser and ultrafast optics applications. Since nonlinear optical phenomena play a key role in many areas of optics and photonics, the meeting covers a wide range of energies and powers, from single-photons to zettawatts, and over broad spectral ranges, from THz to Gamma-ray frequencies.

This joint *Optics Express* / *Optical Materials Express* feature issue contains only a selected fraction of the meeting contributions. However, it gives an excellent flavor of the broad and cutting-edge topics covered by the meeting. Unlike typical conference proceedings, this feature issue requires that all submissions must report new, previously unpublished work, and we follow the regular review process for the journals, which is independent of the conference review.

The 21 papers in this issue (17 *Optics Express* and 4 *Optical Materials Express*) cover a broad range of nonlinear optical effects. Following a trend in recent NLO conferences as well as in the photonics community, ultrafast NLO plays a prominent role, including frequency comb generation [1–3], mode-locking of lasers [4], pulse compression [5] and ultrafast spectroscopy [6]. Another central theme of NLO with significant application impact as well as representation in this issue is the generation of new wavelengths, via second order nonlinearities [7–10] or Raman processes [2,11,12]. Applications also enter biomedical areas, as an exciting contribution on ultrafast laser-based refractive index modifications for ophthalmic devices [13] demonstrates. Other papers cover seminal work on transverse effects and solitons [8,14–16], on nonlinear optical signal processing [17,18], on nonlinear optical materials characterization [19,20], or on optical switching mediated by surface plasmons [21].

Clearly, the field of NLO is as vibrant and burgeoning with new ideas as in previous years, showing its groundbreaking and trend-setting part in optics and photonics. We are eagerly looking forward to the next OSA Nonlinear Optics meeting, to be held July 15-19, 2019, also in Waikoloa, Hawaii, USA.