

## [News](#)

### [Unusual scaling laws for plasmonic nanolasers beyond the diffraction limit](#)

Posted: January 16, 2018

Fig. Schematic of plasmonic and photonic lasers and their cavity modes. a Top: schematic of the plasmonic nanolaser devices consisting of a nanosquare gain material on top of metal separated by a few nanometers of dielectric. Bottom: top and side views of electric field ( $|E|$ ) profiles of a cavity mode in a  $700 \times 700$  [...]

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### [thesis defense](#)

Posted: January 8, 2018

congratulations to Ms. Asgari , Ms. Mahboubi, Ms. Gachilou and Mr. kouhestanian, for defending your dissertation at approved times.

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### [Orientation-Dependent Exciton-Plasmon Coupling in Embedded Organic/Metal Nanowire Heterostructures](#)

Posted: January 7, 2018

Organic/metal nanowire heterostructures for the study of orientation dependent exciton-plasmon coupling. (A)

Numerically simulated  $|E|^2$  distribution of SPPs at the end of a 200-nm-diameter and 6  $\mu\text{m}$ -long AgNW, where SPPs are launched by a dipole oriented along three coordinate axes  $x$ ,  $y$ , and  $z$ , respectively. The dipole is positioned at the middle of [...]

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## [Selectively Plasmon-Enhanced Second-Harmonic Generation from Monolayer Tungsten Diselenide on Flexible Substrates](#)

Posted: January 7, 2018

. Pump-laser-polarization dependent SHG mapping. (a) SEM image of single-crystalline monolayer WSe<sub>2</sub> flake on trenches with a pitch of 910 nm. (b) Simulated electric field distribution at a plane 1 nm above the surface of gold substrate with pump laser polarized perpendicular (left panel) and parallel (right panel) to the trench. The dotted line outlines [...]

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## [Is metal a friend or foe?](#)

Posted: January 6, 2018

A long-standing question debated among the nanophotonics community is whether size matters and helps to reduce the threshold of micrometre- and submicrometre-sized lasers, and whether the presence of metal interfacing the gain medium harms or improves the laser performance. In a work published in Nature Communications, Ren- Min Ma and colleagues<sup>1</sup> address this issue through a [...]

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## [Developing Gold Nanoparticle-Embedded Dielectric Thin Films](#)

Posted: December 18, 2017

research on noble metal nanoparticles has always remained interesting because of their optical and electronic properties. Gold nanoparticles (AuNPs), in particular, have been intensively studied for their fascinating localized surface plasmon resonance (LSPR) peak in the visible region of electromagnetic spectrum. The tunable nature of LSPR of AuNPs leads to a large number of applications [...]

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## [Nano aluminium offers fuel cells on demand – just add water](#)

Posted: December 10, 2017

The accidental discovery of a novel aluminium alloy that reacts with water in a highly unusual way may be the first step to reviving the struggling hydrogen economy. It could offer a convenient and portable source of hydrogen for fuel cells and other applications, potentially transforming the energy market and providing an alternative to batteries and [...]

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## [Hybrid graphene-quantum dot phototransistors with ultrahigh gain](#)

Posted: December 9, 2017

Graphene is an attractive material for optoelectronics<sup>1</sup> and photodetection applications<sup>2–6</sup> because it offers a broad

spectral bandwidth and fast response times. However, weak light absorption and the absence of a gain mechanism that can generate multiple charge carriers from one incident photon have limited the responsivity of graphene-based photodetectors to  $\sim 10^{22}$  AW<sup>-1</sup>. Here, this group [...]

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## [Our New paper in journal of magnetism and magnetic materials](#)

Posted: November 20, 2017

Congratulations for the publication of paper “Enhanced Faraday rotation in one dimensional magneto-plasmonic structure due to Fano resonance” by S. Sadeghi and S. M. Hamidi. Abstract Enhanced Faraday rotation in a new type of Magneto-plasmonic structure with the capability of Fano resonance, has been reported theoretically. A magneto-plasmonic structure composed of a Gold corrugated layer deposited on [...]

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## [Quantitative Evaluation of Nanosecond Pulsed Laser-Induced Photomodification of Plasmonic Gold Nanoparticles](#)

Posted: November 16, 2017

Biophotonic application of plasmonic gold nanoparticles has become a highly active field of research in recent years due to their unique chemical and physical properties, such as high absorption cross sections and spectral tunability<sup>1</sup>. Many of the unique properties of gold nanoparticles are governed by the surface plasmon resonance (SPR) effect, a collective oscillation of [...]

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