

Nanoplasmonics: Citius, Minimus, Fortius! (Faster, Smaller, Stronger!)

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Nanoplasmonics deals with collective electron dynamics on the surface of metal nanostructures, which arises due to excitations called surface plasmons. The surface plasmons localize and concentrate optical energy in nanoscopic regions creating highly enhanced local optical fields. They undergo ultrafast dynamics with timescales as short as a few hundred attoseconds. We will start with a brief overview of the state of nanoplasmonics. From the latest developments and original work in nanoplasmonics, we will consider spaser (quantum nanoscale optical generator and ultrafast amplifier) and metallization of dielectric nanosystems by a strong optical field.