

Nano-manipulation of light through plasmonics for creating and studying new nanotechnologies and optical phenomena

#ナノ光学技術

#光計測

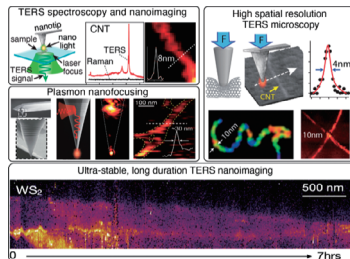
#ナノフォトニクス

#ナノイメージング

#プラズモニクス

研究内容

Light wavelengths within and around the visible spectrum are generally too large for light-matter interaction at the nanoscale. Plasmonic nanotips offer a cutting-edge solution for manipulating light by confining it into a nanometric volume and opening up a range of possibilities for its nanoscale applications. When combined with non-destructive optical techniques such as Raman spectroscopy and imaging, this plasmonic approach facilitates one to "see" the physical, chemical, and biological phenomena occurring at the nanometer scale, and even down to the sub-nanometer scale. Our group is actively engaged in inventing, developing, and improving world-class instrumentation for plasmonics-based optical techniques. This includes technologies such as tip-enhanced Raman spectroscopy/microscopy and plasmon nanofocusing, which we utilize for nano-investigation and nanoimaging of a diverse range of physical, chemical, and biological properties in a variety of samples. Additionally, these technologies are also applied in the precise control of chemical reactions and optical switching at the nanometer scale.



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応用分野

ナノスケールの新現象、材料解析、ナノスケール化学反応、光スイッチング、バイオ研究



バルマ プラバット VERMA Prabhat

物理学系専攻 教授

応用物理学講座 ナノスペクトロスコピー領域
バルマ研究室

論文・解説など

- [1] R. Kato *et al.*, *Science Advances* 8, eabo4021 (2022).
- [2] T. Umakoshi *et al.*, *Science Advances* 6, eaba4179 (2020).
- [3] T. Mino *et al.*, *ACS Nano* 8, 10187 (2014).

連絡先HP

