Moiré nanolasers

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The invention of the laser has greatly advanced modern science and technology, and recently, microscale lasers have emerged as a cornerstone of modern information technology. This presentation will delve into the origins, fundamental physics, and evolution of a new category of nanoscale lasers, known as moirй nanolasers. Our exploration reveals that through a simple twist, nanocavities boasting quality factors exceeding 200 billion can be engineered. Moreover, we will demonstrate the feasibility of achieving high-performance coherent nanolasing, ranging from individual nanocavities to reconfigurable arrays within moirй superlattices.

References:

[1] Reconfigurable moirй nanolaser arrays with phase synchronization, Nature 624, 282-288 (2023).
[2] Magic-angle lasers in nanostructured moirй superlattice. Nature Nanotechnology 16, 1099-1105 (2021)
[3] Twisted lattice nanocavity with theoretical quality factor exceeding 200 billion. Fundamental Research 3, 537-543 (2023)
[4] Applications of Nanolasers. Nature Nanotechnology 14, 12-22 (2019)

Short Bio:

Ren-Min Ma, professor of physics, Peking University. Dr. Ma received his PhD degree in Physics from Peking University in 2009. He was a postdoc researcher at UC Berkeley during 2009 to 2014 before joining Peking University as a faculty. His research interests include laser physics, nanophotonics, light-matter interaction, non-Hermitian and topological photonics. He published over 70 peer reviewed papers, including 4 in Science/Nature, 11 in Science/Nature sub-journals, 2 in PRL. His works has been selected as China's Top 10 Optical Breakthroughs of 2018 and 2020, APS Physics Top 10 "Highlights of the Year" of 2018, China's Top 10 Semiconductor Research Breakthroughs of 2020, and Top 100 high impact research articles of China 2020. He has received China National Funds for Distinguished Young Scientists, Xplorer Prize and Wang Da-Heng Optics Prize etc. He has made over 100 invited, keynote and plenary presentations at APS March Meeting, CLEO, Nature Conference, MRS,

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