Opto-Quantum System

Division of Electrical, Electronic, and Information Engineering
Graduate School of Engineering

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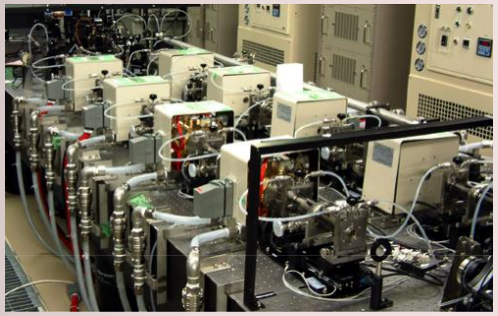
2022-2026 For the Next 50 YEARS

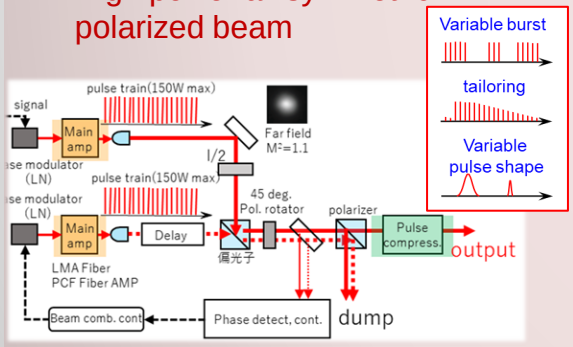
High-power laser technology and temporal-spatial control of light & advanced applications

⇒ POWER PHOTONICS

Development of ultra high-power laser system

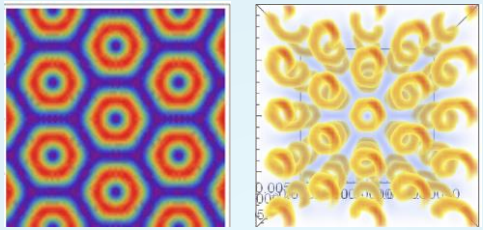


High power axisymmetric polarized beam

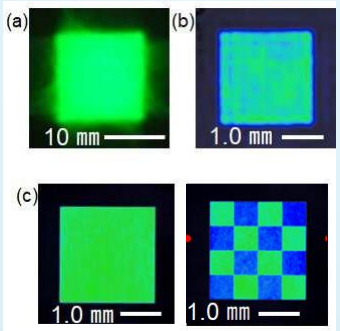


GHz variable burst laser

Precision control of light structures in spatio-temporal domain



Mega-optical vortex and optical tornado

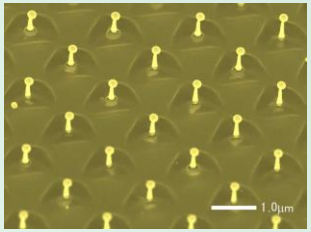


Conventional method

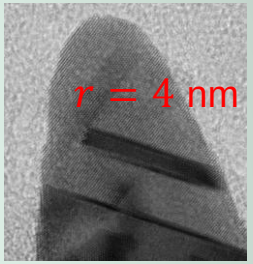
New method

Ultra-high precision beam shaping using phase gratings and $4f$ optics

Fabrication of nanomaterials by ultra-short laser pulse laser processing

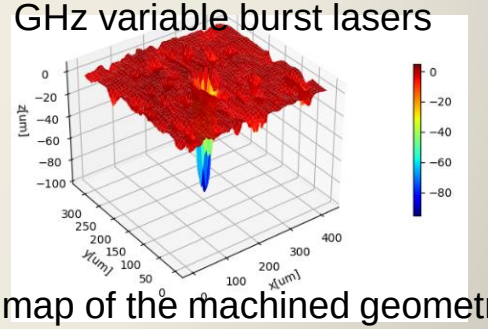


Gold nanodrop matrix



Gold nanowhisker matrix; world finest structure by laser processing

Highly efficient processing with GHz variable burst lasers



3D map of the machined geometry

We aim to develop power photonics technology using the "laser," essential for 21st-century tech. Our research integrates power laser development, ultra-precision control, and application. This includes developing ultra-short pulse, high-intensity lasers, and control tech for optical structures. We will apply these technologies to research like creating nano-materials, plasmonics, and eco-processing.