

Prof. Yung-Fu Chen / Department of Electrophysics

Laser Technology, Laser Physic, Opto-electronics s, Quantum Physics

We are “Laser Physics and Technology Research Group” in the Dept. of Electrophysics, NCTU. The research topics include novel laser technologies, laser physics, nonlinear optics, and quantum theory. The main achievements are as follows: (1) Explore the design criteria for scaling up the diode-end-pumped solid-state lasers (Figure 1). (2) Develop the compact diode-pumped dual-wavelength lasers (Figure 2). (3) Realize the self-Raman lasers with vanadate crystals for the first time. (4) Originally exploit micro-cavity lasers to analogously manifest the quantum wave functions. The breadth involves the quantum-classical connection (Figure 3), quantum chaos (Figure 4), singular optics, and spatially mode-locked states (Figure 5). All pioneering works with 9 papers have been published in the Physical Review Letters. So far, we have published more than 250 papers in SCI journals, such as Phys. Rev. Lett., Phys. Rev. A, Phys. Rev. E, Opt. Lett., Opt. Express, J. Opt. Soc. B, Appl. Opt., IEEE J-QE, Appl. Phys. B, etc.. The average citation number per year is nearly 400. There are 10 papers with citation number higher than 100 in google scholar citation. We have transferred the passively Q-switched Nd:YAG laser and the green and yellow high-power CW lasers to the outside Incorporation to get the FDA proofs in ophthalmology .

Key Facilities: 20 GHz High-Frequency Digital oscilloscope, High-Resolution Optical Spectrum Analyzer, 26.5 GHz Power Spectrum Analyzer, High-Power Diode Lasers, and Laser Power and Energy Meters.

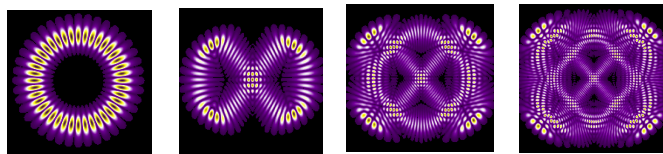


Figure 3

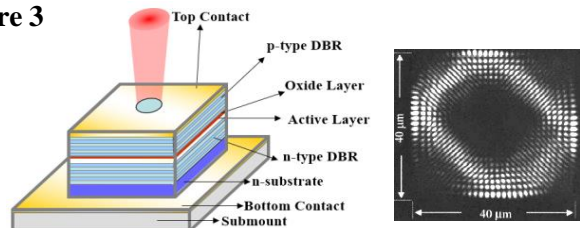


Figure 4

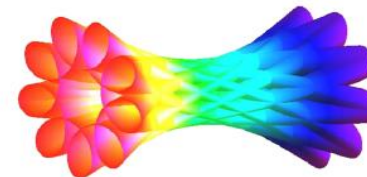
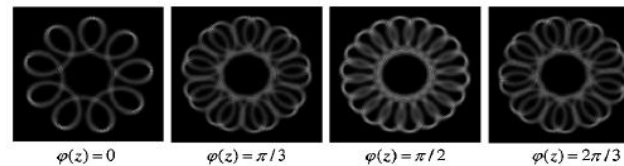


Figure 5

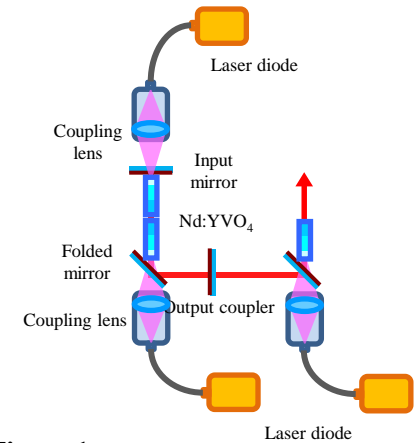


Figure 1

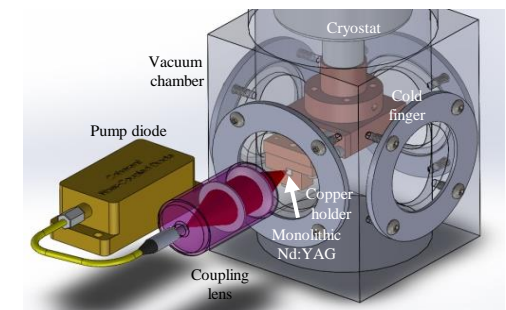


Figure 2