The Experimental Laser Ranging System for Space Debris at Shanghai

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GOALS

- Development of the technology for space debris laser tracking
- Experimental observations and orbit determinations for space debris, not routine observations

Status and Plans

- **A China-made 40W Q-switch Nd:YAG laser (2J in 532 nm, 10ns, 20Hz) has been installed.**
- **A new transmitting telescope (D=210mm) is working.**
- **A new servo system based on the 413CE drive modules from the COPLEY Corporation has been built and has replaced the old one. It has improved the tracking of mount.**

Status and Plans

- **Due to the poor quality of images of the receiving optics (D=600mm), a set of new primary and secondary mirrors with dielectric coating has been built and will replace old one soon.**
- **The test ranging to the satellites with retro-reflectors have been done. The next step will try to ranging to uncooperative space targets soon.**
- **A tip-tilt mirror will be added into the transmitting optics to improve the tracking in near future.**

Shanghai Observatory, CHINA

SLR House in Shanghai


SLR House in Shanghai

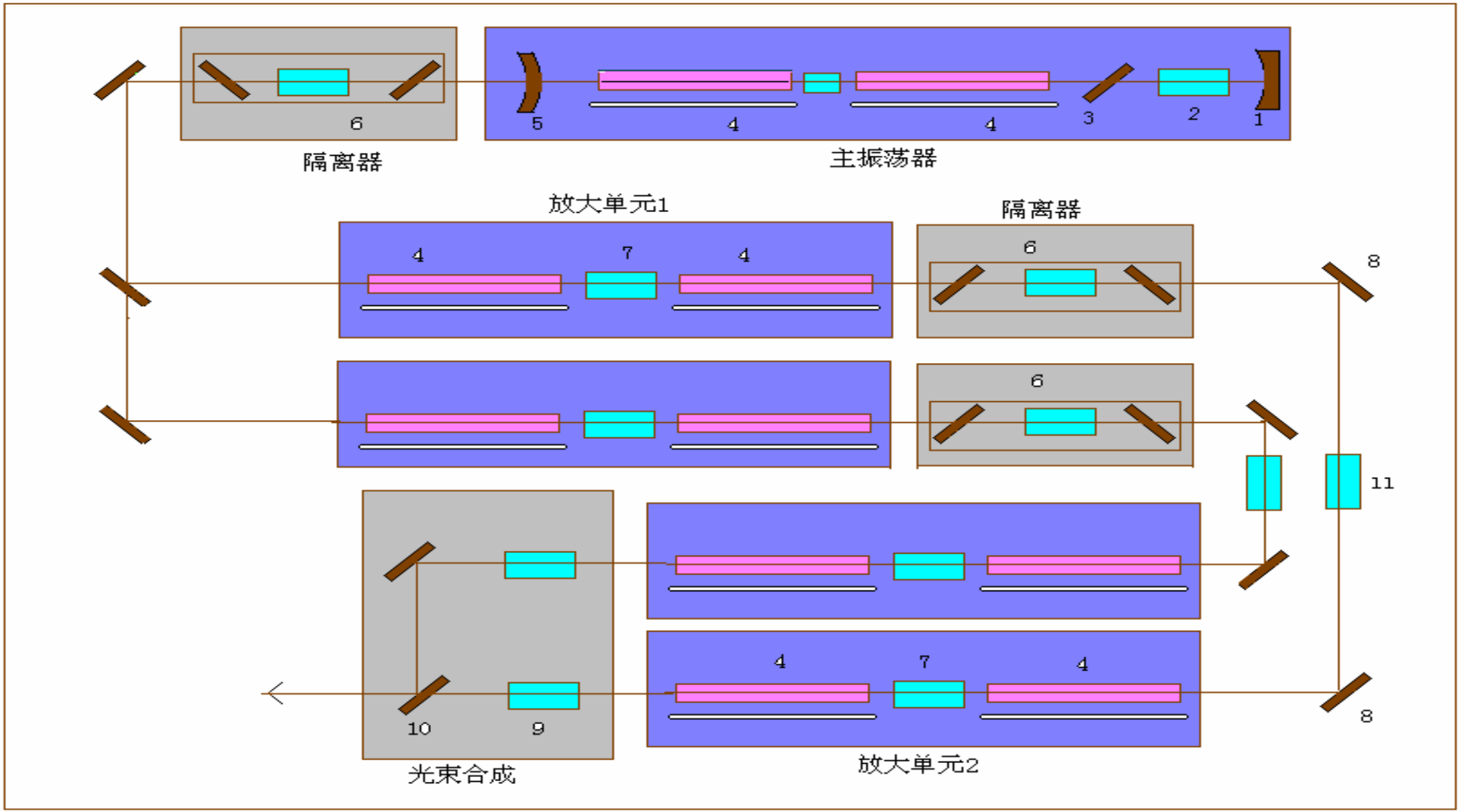
SLR Telescope
(Aperture 600mm)

Electronics Room

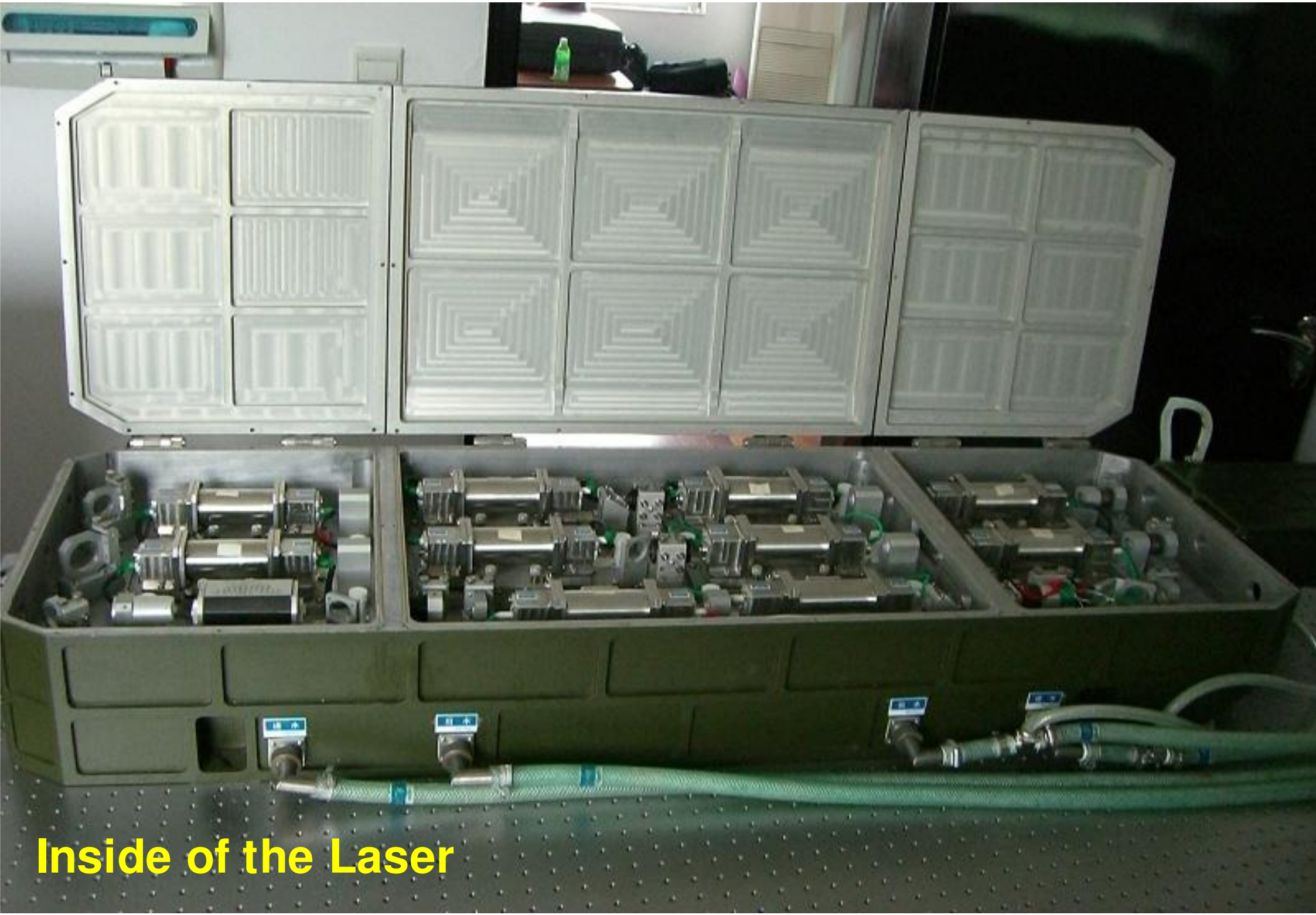

High Power
Laser Power Supply

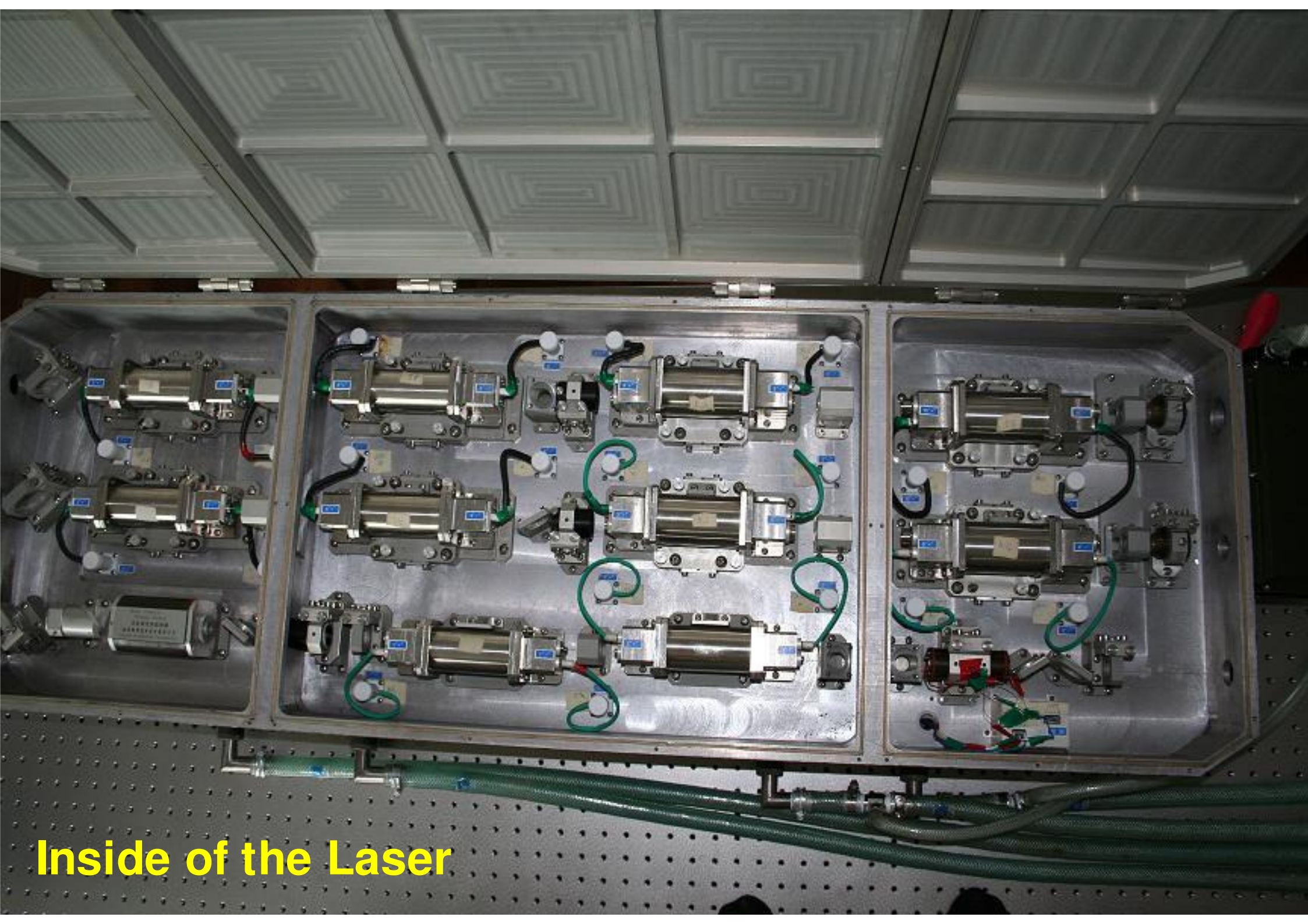
Power Supply & Cooling

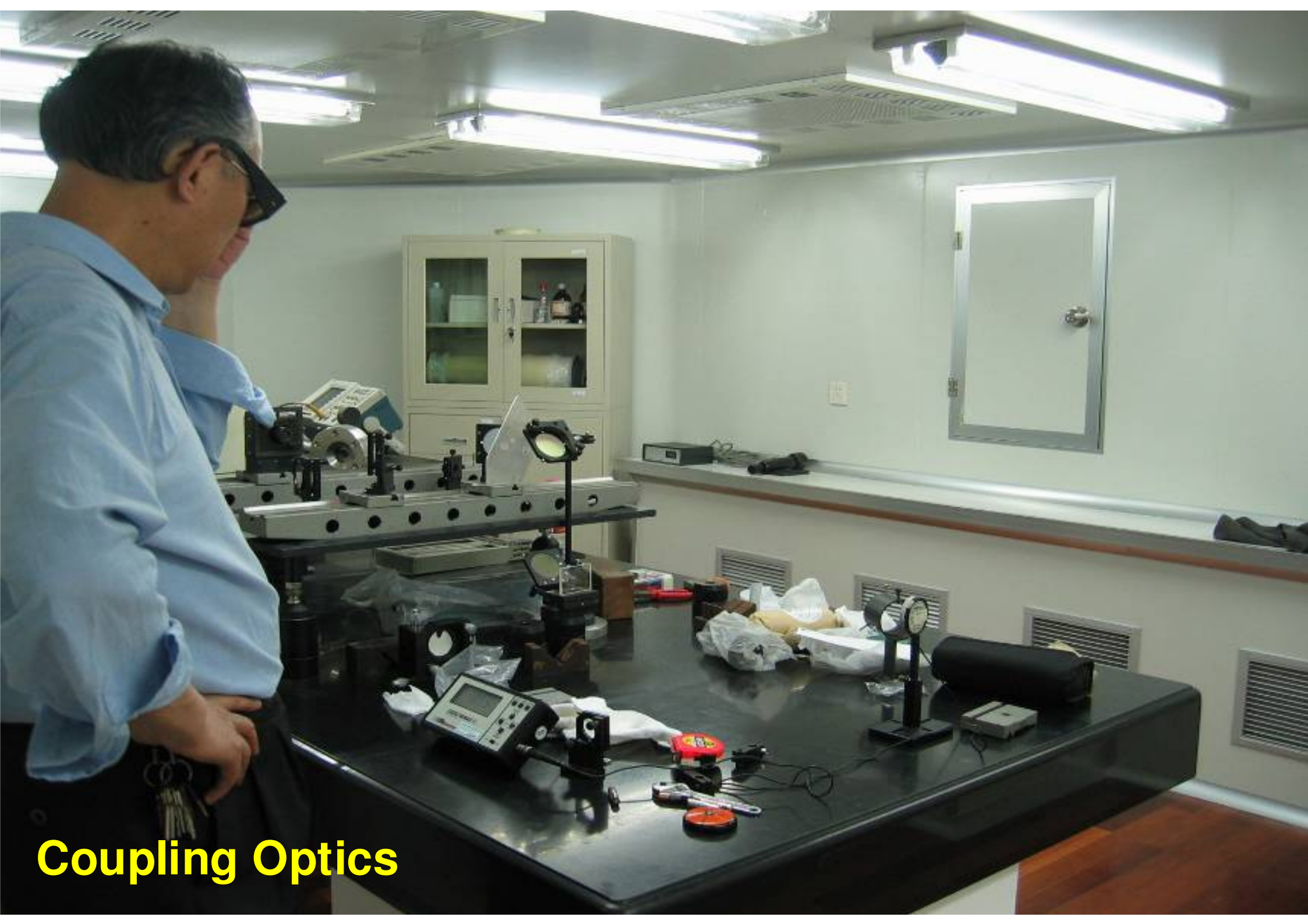
Output of High Power Laser



Block Diagram of Laser

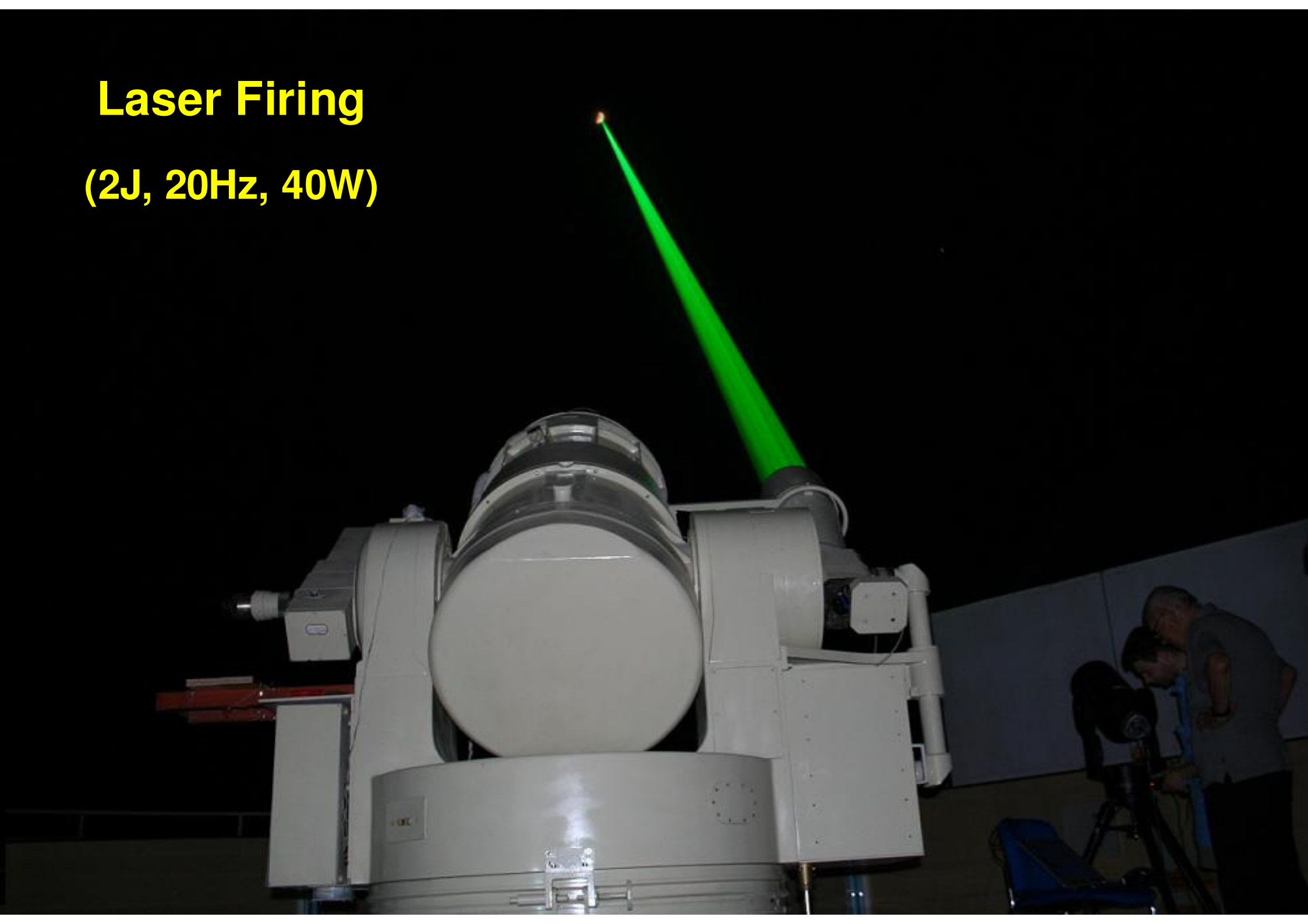

Inside of the Laser


Inside of the Laser


Coupling Optics

Laser Firing

(2J, 20Hz, 40W)




Space Debris Laser Ranging Project
(40W Pulsed Nd:YAG Laser)

Thank you