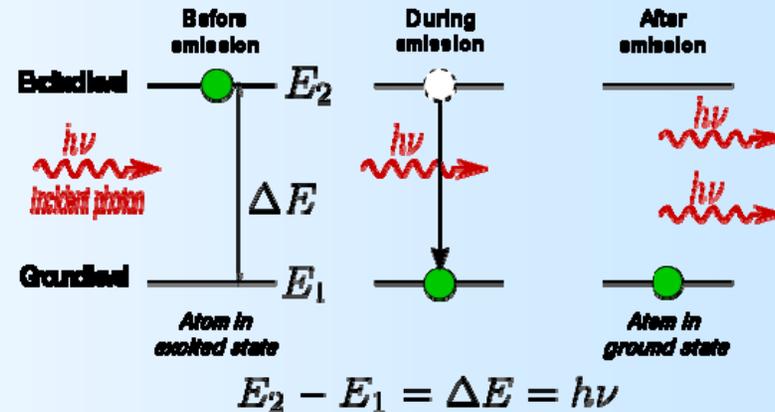


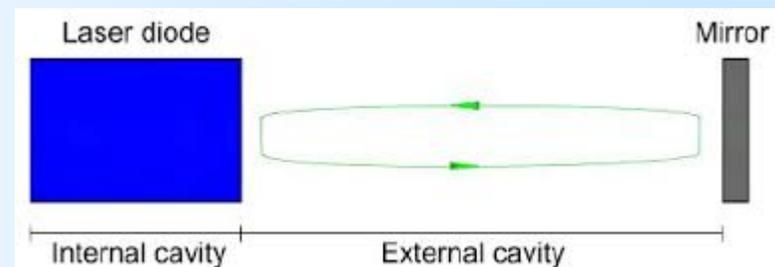


Principles of Laser Operation

- Population Inversion
 - Pump energy \rightarrow population of higher energy state
 - Delivers gain by stimulated emission

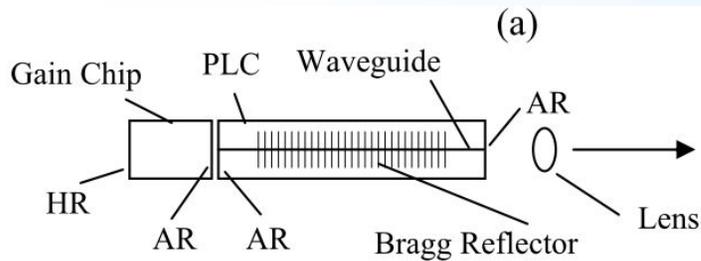


- Optical Feedback
 - Stabilizes laser frequency and spatial mode

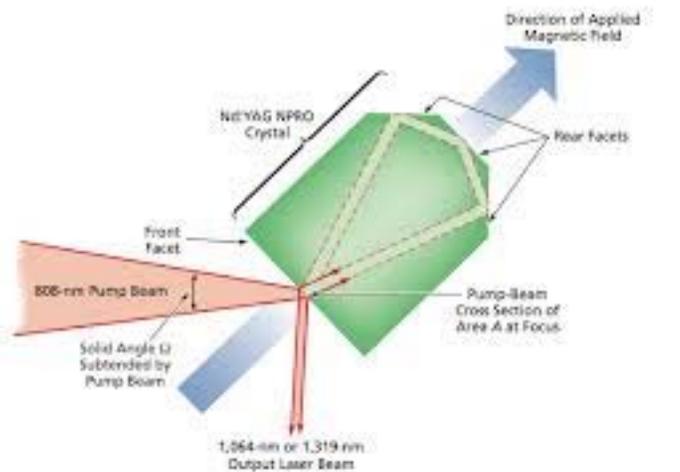




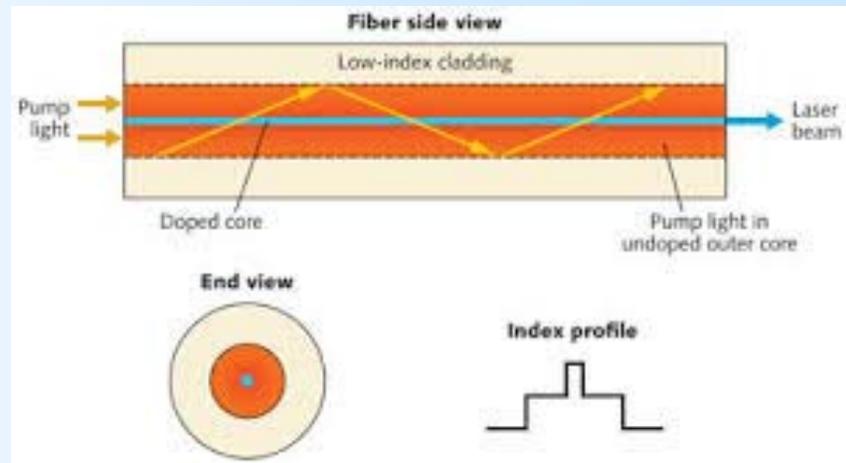
Types of lasers we may use for LISA



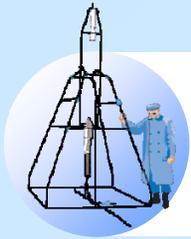
Semiconductor laser: ECL



Solid state laser: NPRO

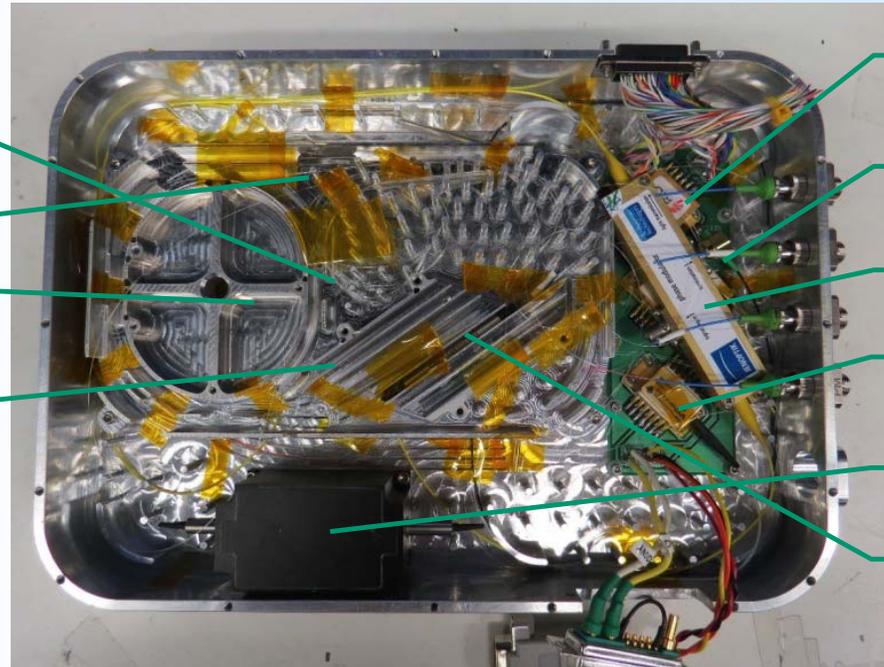


Fiber amplifier



Initial Goddard Laser System (built by Kenji Numata)

- Under the tray
- Gain fiber
- Pump combiner
- Mode field adapter
- Cladding power stripper



- Master oscillator (PW-ECL)
- Preamplifier (SOA)
- Phase modulator
- Pump LD for power amplifier
- Optical isolator
- Fused coupler (for main power monitor)

LISA requirements: 2 W Power, very low noise