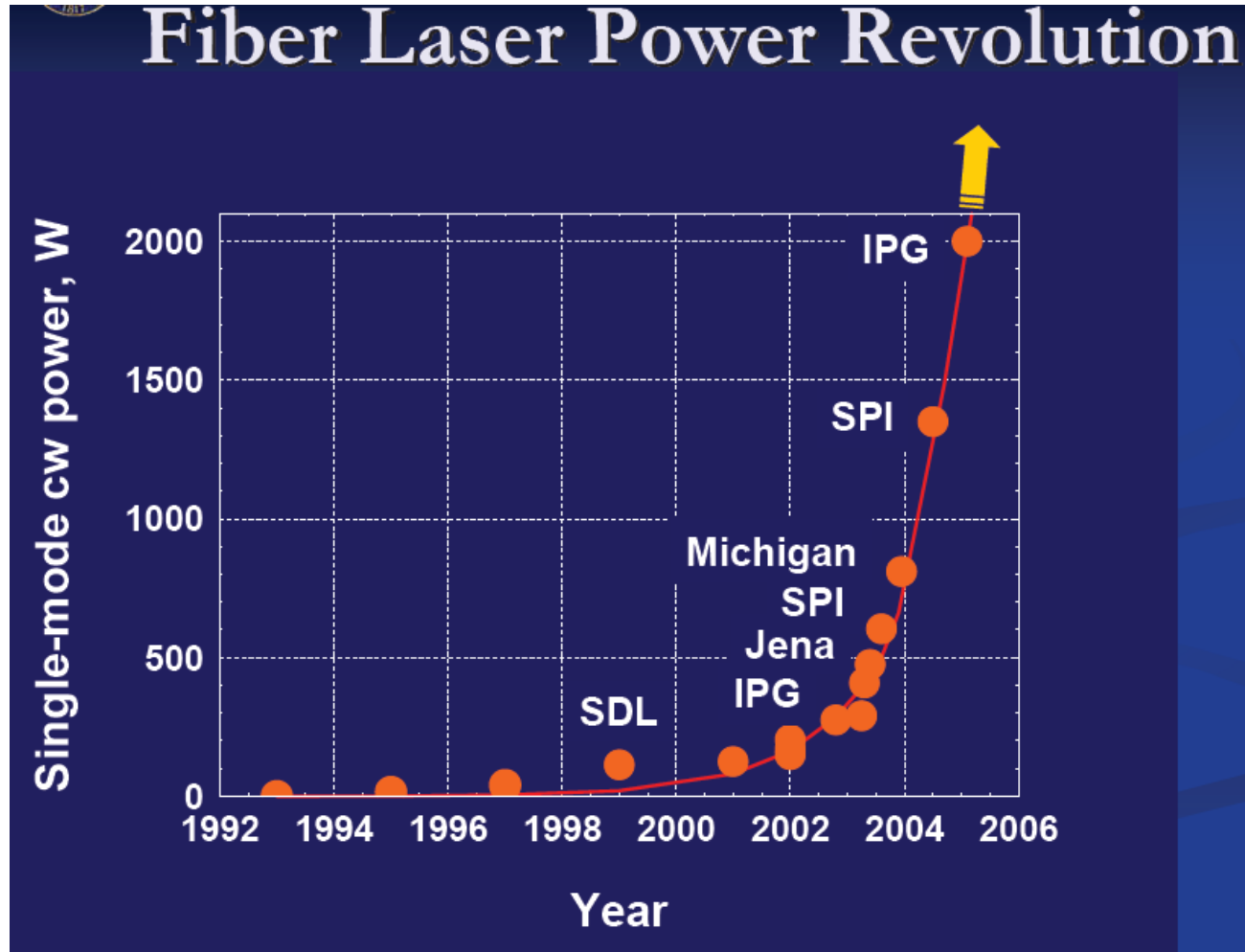


Fiber Laser



<http://www.tianhonglaser.com>

Fiber Laser Power



Laser for Material Processing

	CO ₂	Nd:YAG (Lamp)	Disk Laser	Fiber Laser	Diode Laser
Capital [\$ / W]	40 - 80	120 - 400	140 - 500	120 - 200	10 - 140
Hourly Cost (4 kW, 4,000hrs)	\$5	\$10	\$15	\$2	\$2
Maintenance [hrs]	1,000	1,000	10,000	>20,000	10,000
Wall Plug Efficiency	10%	2%	25%	25%	30%
Wavelength [μm]	10	1	1	1 - 2	0.9
Beam Guidance	Mirror	Fiber	Fiber	Fiber	Fiber
Power Density [MW/cm ²]	10	10	100	100	0.1
Footprint [cft]	20	20	6	5	4
Absorptivity					
Metals	8%	20%	20%	20%	25%
Composites	100%	50%	50%	50%	50%

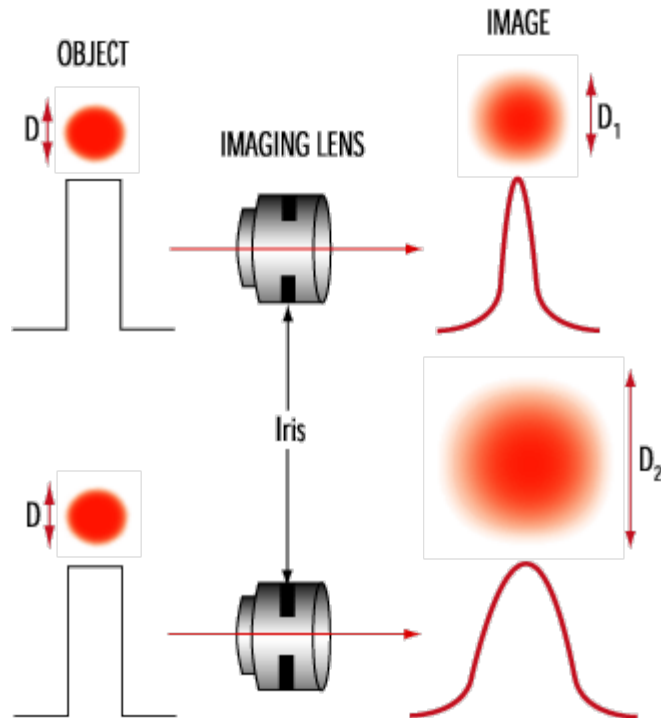
Courtesy: S. Heinemann, Fraunhofer USA

1W Fiber Laser



\$149 (eBay Shop Junktronics)
www.junktronics.com

Diffraction Limit

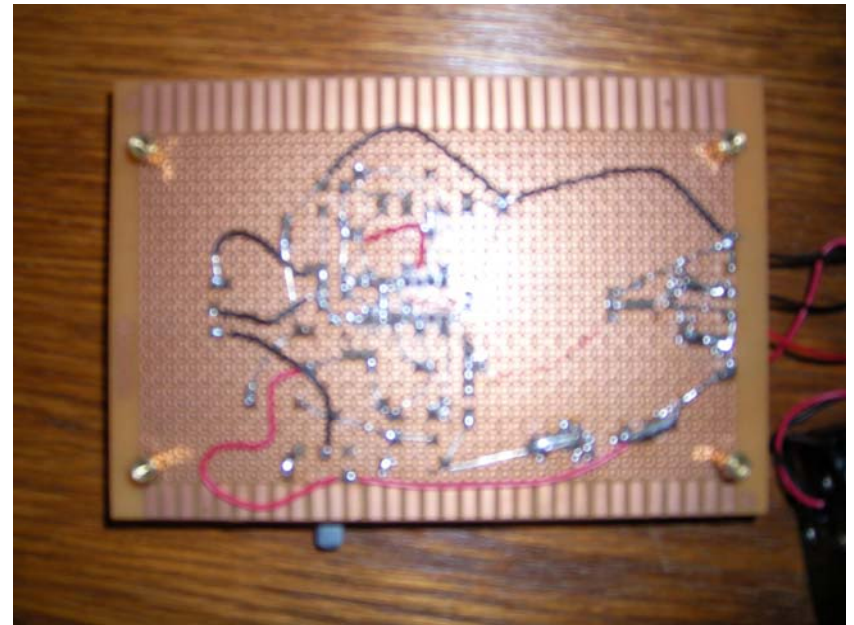
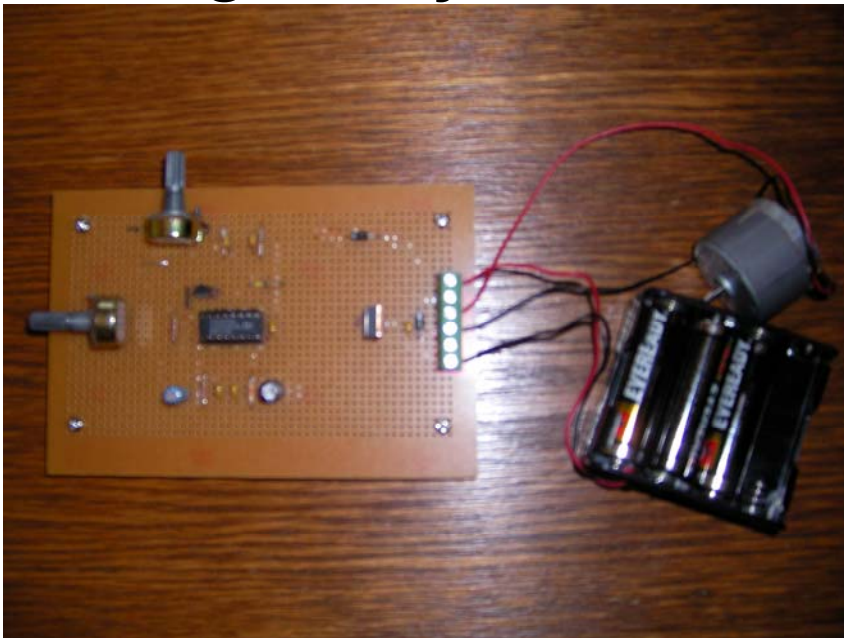


$$\text{Spot Dia. (d)} = 2.44 \times \text{Wavelength} \times f/\#$$

Need about 10W Fiber Laser to match 30W CO2 Laser

DC Motor Speed Controller

- Variable Speed
- 60V, 50A
- Need to convert to cad.py
- Single Layer



DC Motor Speed Controller

