

# Laser Propulsion

## Thoughts on the Roadmap

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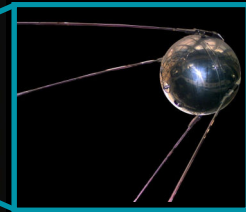


75 years of R&D



Credits: 12019 via Pixabay

Credits: Didgeman via Pixabay



Credits: NASA imagery via Pixabay

1957

75 years of R&D?



\* 2032 ???

Image: Public Domain

# Launch Vehicles ~ High-Power Lasers

# Backbone: *Scalable* Launch Vehicles



Image: ignis – CC BY-SA 3.0



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→ Main Focus: *Sustainable European Launch Capability*

# Backbone: Scalable High-Power Lasers



- **Mandatory** backbone
  - **Dual use** potential
    - **Scale** or **fail**

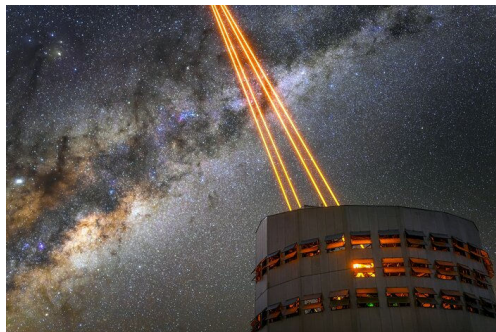
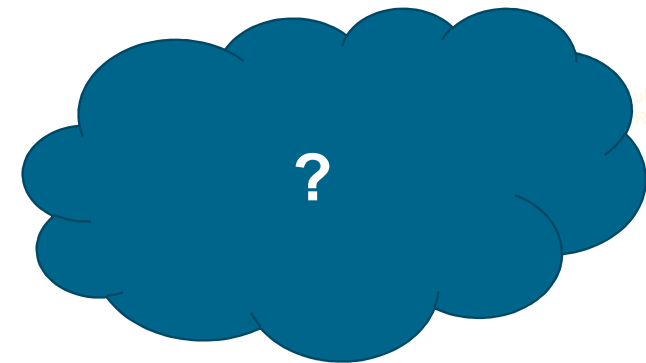


Image: ESO – CC BY 4.0



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Robin et al., Adv. Space Res. 58: 1093 (2016)

- CW -



1 W

1 kW

1 MW

1 GW

→ **Main Focus: Sustainable European High-Power Laser Capability**

# Backbone: Scalable High-Power Lasers



- **Mandatory backbone**
  - **Dual use potential**
    - **Scale or fail**

100 kJ  
1 kJ  
1 J  
1 mJ



Image Commander-pirx, CC BY-SA 3.0 de

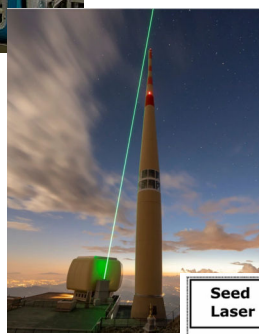


Image: Houard et al., Nature Photonics 17, 231-235 (2023), open access

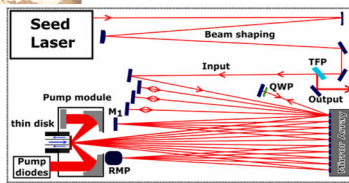


Image: Ahmed et al., doi.org/10.1515/aot-2021-0047 open access

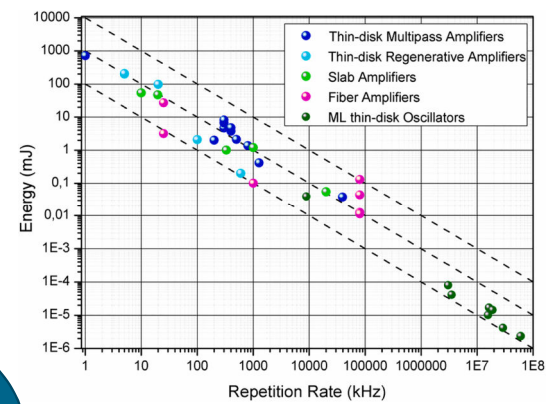
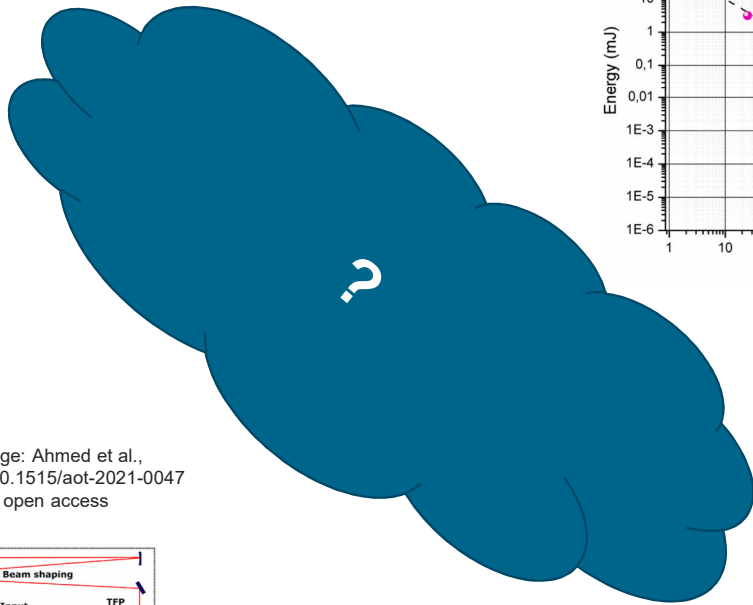


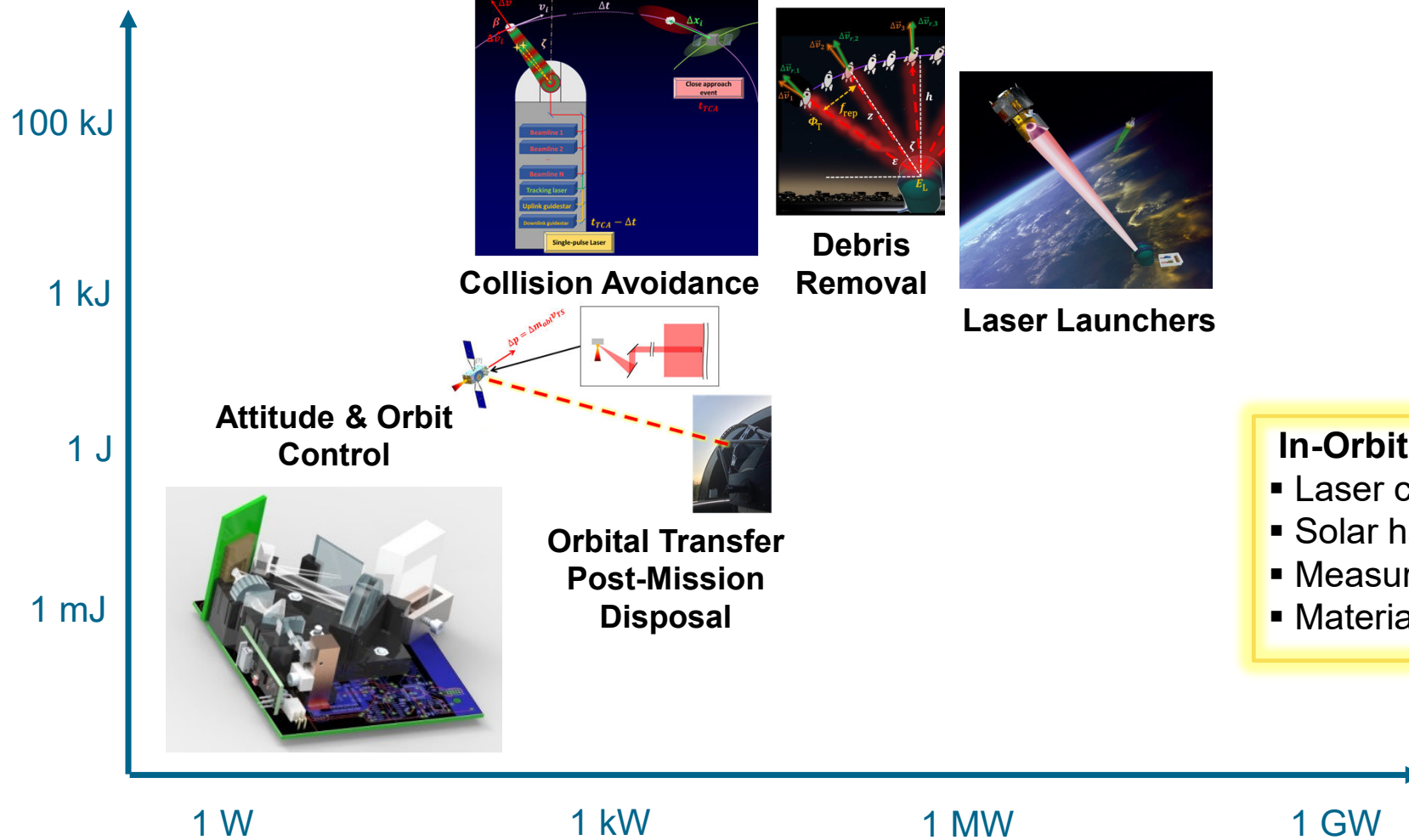
Image: Ahmed et al., doi.org/10.1515/aot-2021-0047 open access

- pulsed -

1 W                      1 kW                      1 MW                      1 GW

→ Main Focus: Sustainable European High-Power Laser Capability

# Laser Space Applications



→ Main Focus: *Sustainable European Laser Propulsion Capability*