R&D phase | Research **Expected Commercialization** | FY30-

Mehr Licht!
More Photonics for Intelligence

#D11

#Resilience#Safety and Security

Lunar Energy Infra via Laser Power Beam

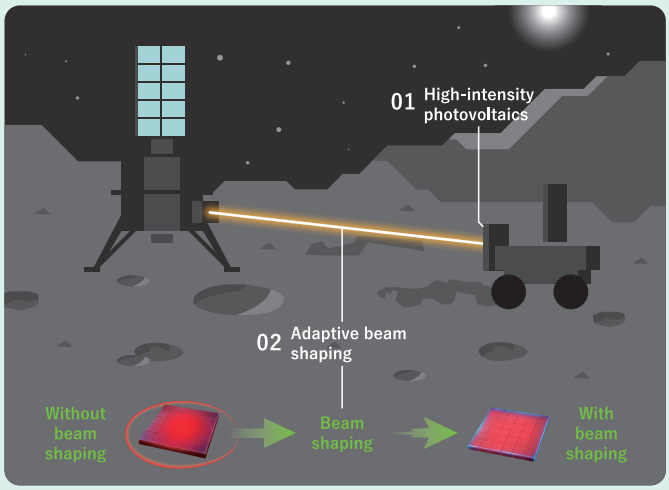
Delivering power with light to extend lunar-exploration range

Technical Challenges & Goals

Long lunar nights and permanently shadowed craters prevent solar generation, and laying cables is difficult. This technology efficiently converts high-intensity laser light into electricity and shapes the beam for uniform illumination of moving receivers, enabling stable power delivery to rovers and lunar bases.

月面を、電力の制約から解放する Laser power beaming for lunar exploration

レーザー給電によりローバーの活動範囲を拡大し、これまで到達できなかった領域での探査を可能にします。
Laser power beaming expands the reach of lunar rovers, opening new frontiers for lunar exploration



01 高照射・高効率光電変換素子
High-intensity photovoltaics

高い照射強度でも高効率を維持
Maintains high efficiency at high irradiance

小面積で大電力を発電
Generates high power from a compact area

02 移動体対応ビーム整形
Adaptive beam shaping

距離と姿勢に応じてビーム形状を最適化
Optimizes the beam profile in real time according to the receiver's distance and attitude

移動中も受電面全体への均一照射を維持
Maintains uniform irradiance across the entire receiver surface while the receiver is in motion

Key Technologies

Core Technologies

- 42% efficiency at 1064 nm, 4 W/cm²
- Real-time beam shaping for moving receivers

Key Differentiators

- World-class 42% efficiency at 4 W/cm²
- Beam shaping matches moving receiver geometry

Use Cases

Aerospace & Defense

Laser power is transmitted from a lunar lander to rovers, bases, and communications equipment operating at night or in permanently shadowed regions, enabling stable energy infrastructure without laying cables.

Exhibitors

NTT Space Environment and Energy laboratories

CONTACT：Zero Environmental Impact Research Project