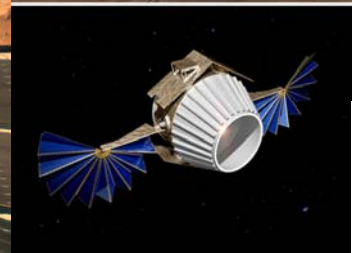
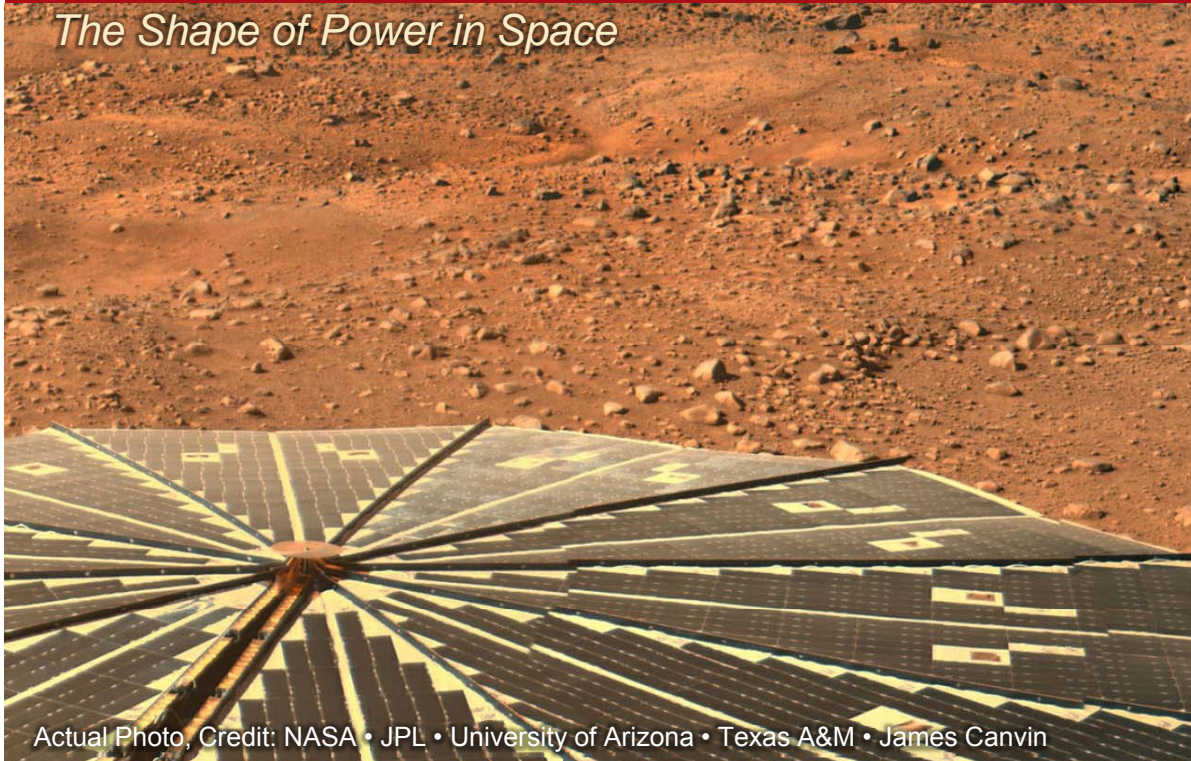


UltraFlex Solar Array Systems

The Shape of Power in Space



Actual Photo, Credit: NASA • JPL • University of Arizona • Texas A&M • James Canvin

Breakthrough performance, competitive cost, space flight proven

Ultra-

- **Lightweight:** $\frac{1}{3}$ to $\frac{1}{4}$ total mass*
- **High Strength:** $>10x$ max on-orbit acceleration*
- **High Deployed Stiffness:** 3-8x higher 1st mode*
- **Compact:** $\frac{1}{4}$ stowage volume and footprint*
- **Reliable:** flight proven technology

* compared with rigid panel solar array of same power

- Flexible

- **Interchangeable** with rigid array technology
- **Scalable:** $\sim\varnothing 1.7$ m (0.5 kW) to $\varnothing 7$ m (10 kW) and beyond
- **Customizable:** may be optimized for \$/W, W/kg, deployed frequency, etc.
- **Maneuverable:** option to withstand >3 g's deployed (e.g. for landing, docking, or transfer orbit power)
- **All photovoltaic technologies accommodated**

Motor Driven Deployment / Staging Options:

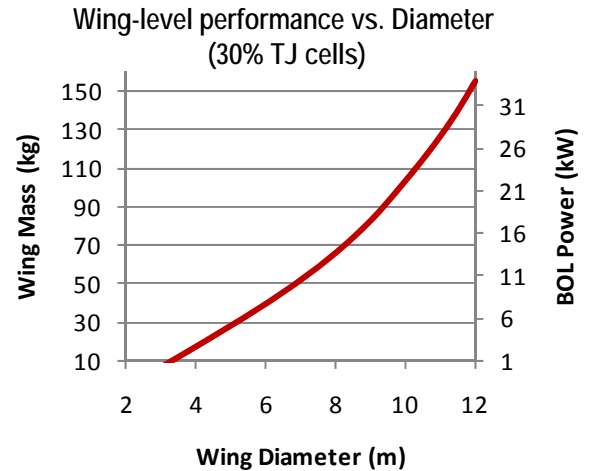
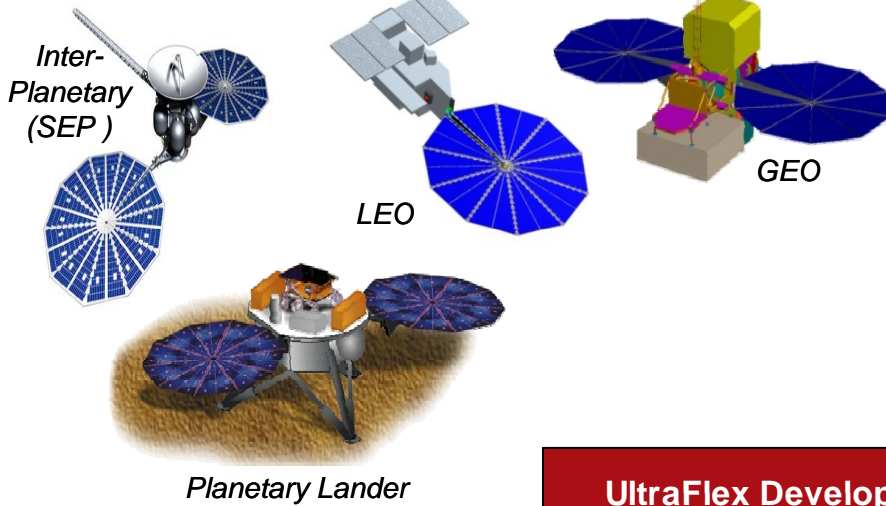
- "Standard" wing staging (e.g. Phoenix, ST8)
- With simple hinged boom (e.g. Orion CEV)

Wing staging may be uniquely configured using simple spring-powered, latching hinge attachment to static panel



UltraFlex Solar Array Systems

Qualified for all Environments:



Proven Technologies

Deployment mechanism & kinematics

- Wing staging, unfurling, tape-driven tensioning and final latching

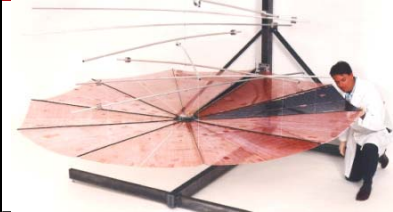






Cells/ Gores

- Substrate scrim fiber and coating
- Cells – same as rigid panel arrays
- Cell laydown/ packaging on scrim substrate

Launch tiedowns –standard flight-proven, low-shock, resettable release mechanisms

Stowage/ Packaging

- Composite panels – same construction technology/ materials as rigid panel arrays
- Stowed stack interleaving cells/substrate and backside foam
- Stack preload optimization

UltraFlex Development Programs	Wing Dia. (m)	Maturity Achieved
 Qualification UltraFlex solar array wing	3.1	Successfully completed full wing level qualification tests
 Wake Shield 04	3.2	Completed PDR & 90% of design
 Ball/ABLE INSIDE Jupiter Qual-Board	4.5	Deep Space Coupon qualification
 Mars 01-Lander	2.1	Flight hardware delivered
 Mars Phoenix Lander	2.1	100% Flight success
 NASA-New Millenium ST8	5.5	Completed CDR; TRL 6
 NASA Crew Exploration Vehicle - Orion	6.0	PDR 8/2009 (ongoing)

For information contact:

ATK-Goleta

600 Pine Avenue, Goleta, CA 93111

805 685-2262 Tel 805 685-1369 Fax

info-goleta@atk.com

Non-export controlled – Marketing Level