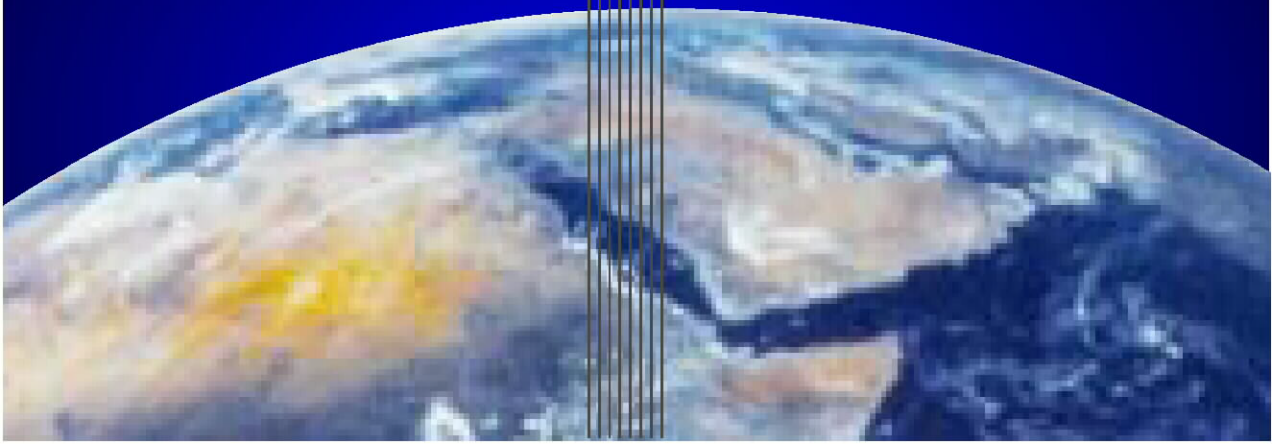
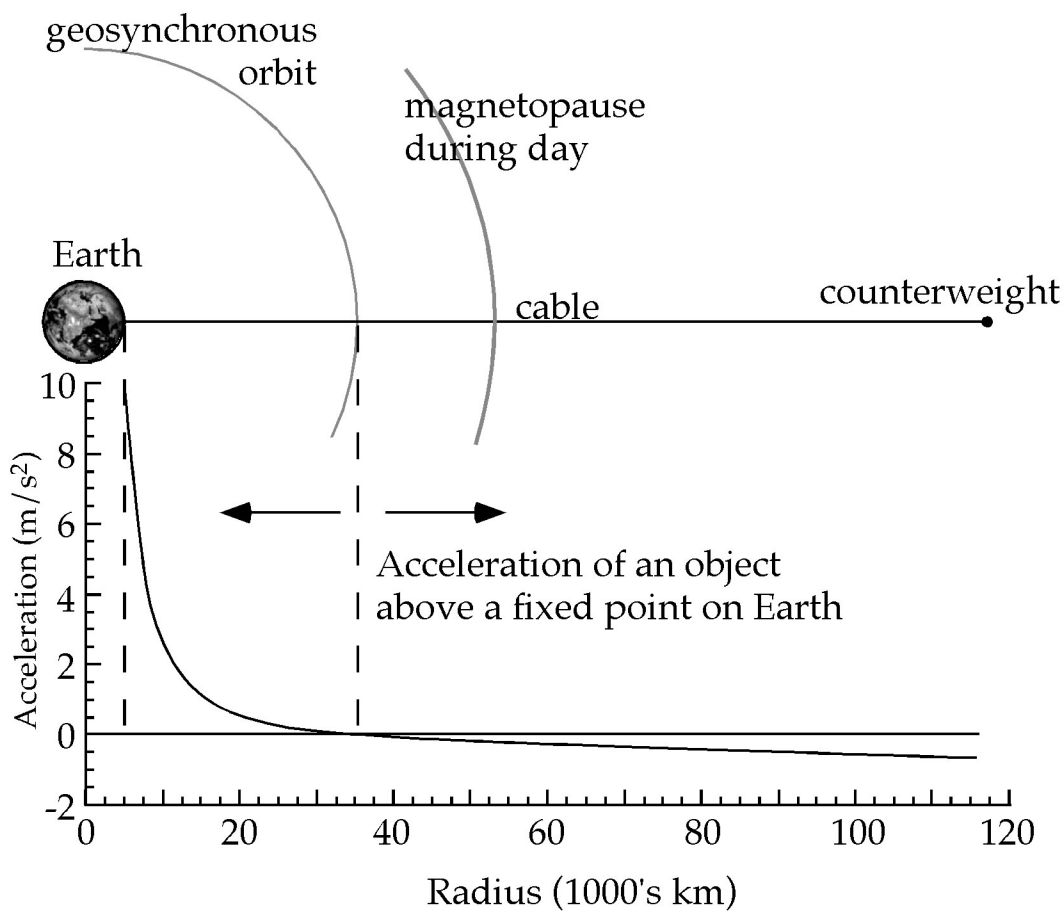


THE SPACE ELEVATOR

Presented by
Brad Edwards



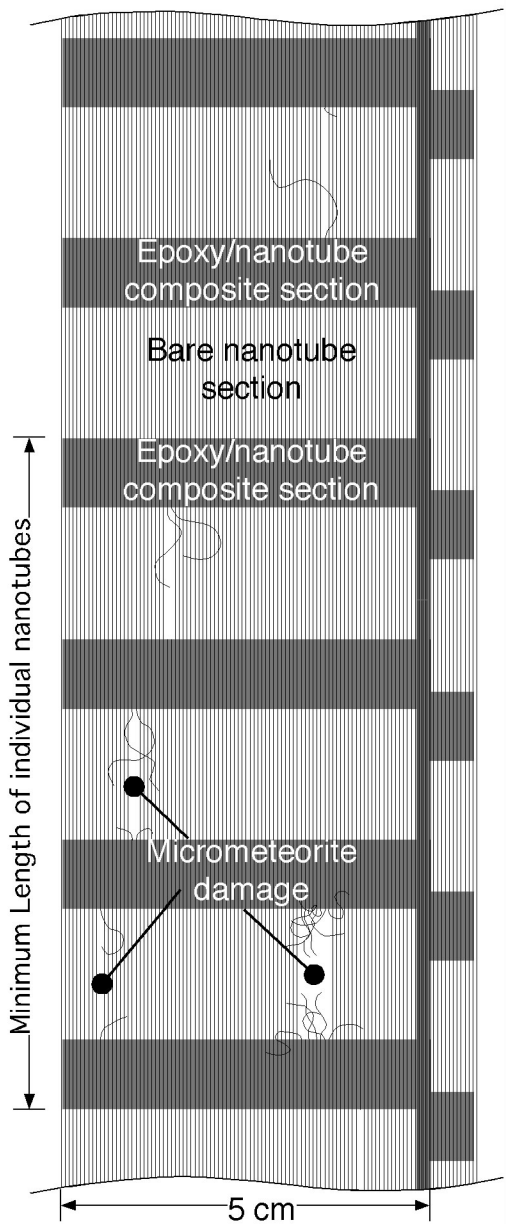
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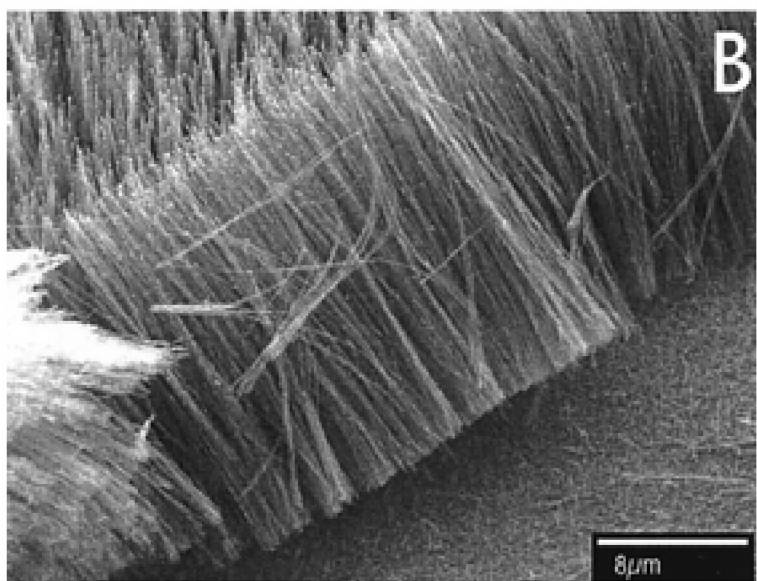
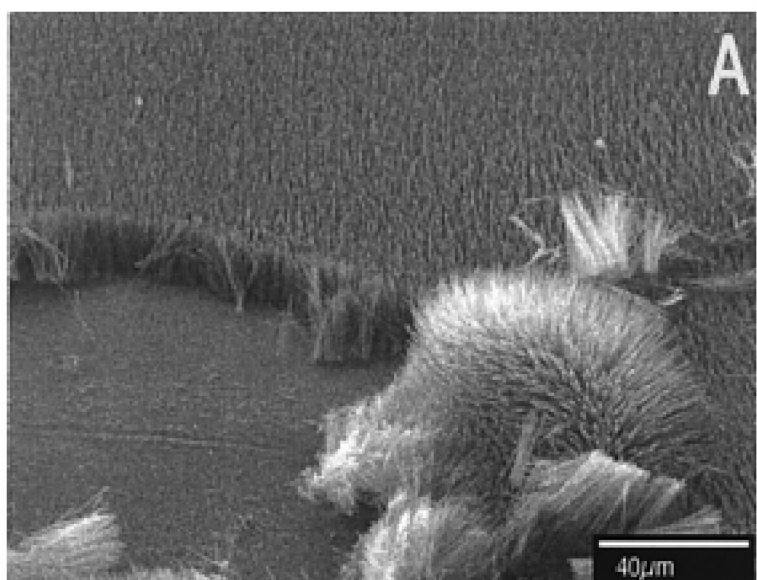
Aspects of a Space Elevator:

1. Cable fabrication
 - A. Nanotubes
 - B. Basic cable design
2. Deployment of the Space Elevator
 - A. Initial cable deployment
 - B. Climber design
 - C. Schedule
3. Utilization stage
 - A. Alternatives
 - B. Exploration
4. Challenges
 - A. Micrometeorite impacts on cable
 - B. Low-earth orbit spacecraft impacts on cable
 - C. Radiation and atomic O damage of cable
 - D. Cable heating by induced electrical currents
 - E. Natural frequency and oscillations in the cable
 - F. Deployment locations
 - i. Power beaming
 - ii. Jet streams and cyclones
 - iii. Lightning
 - iv. Active avoidance
 - v. Optimal locations
 - G. Risks of severed cables and malfunctioning climbers

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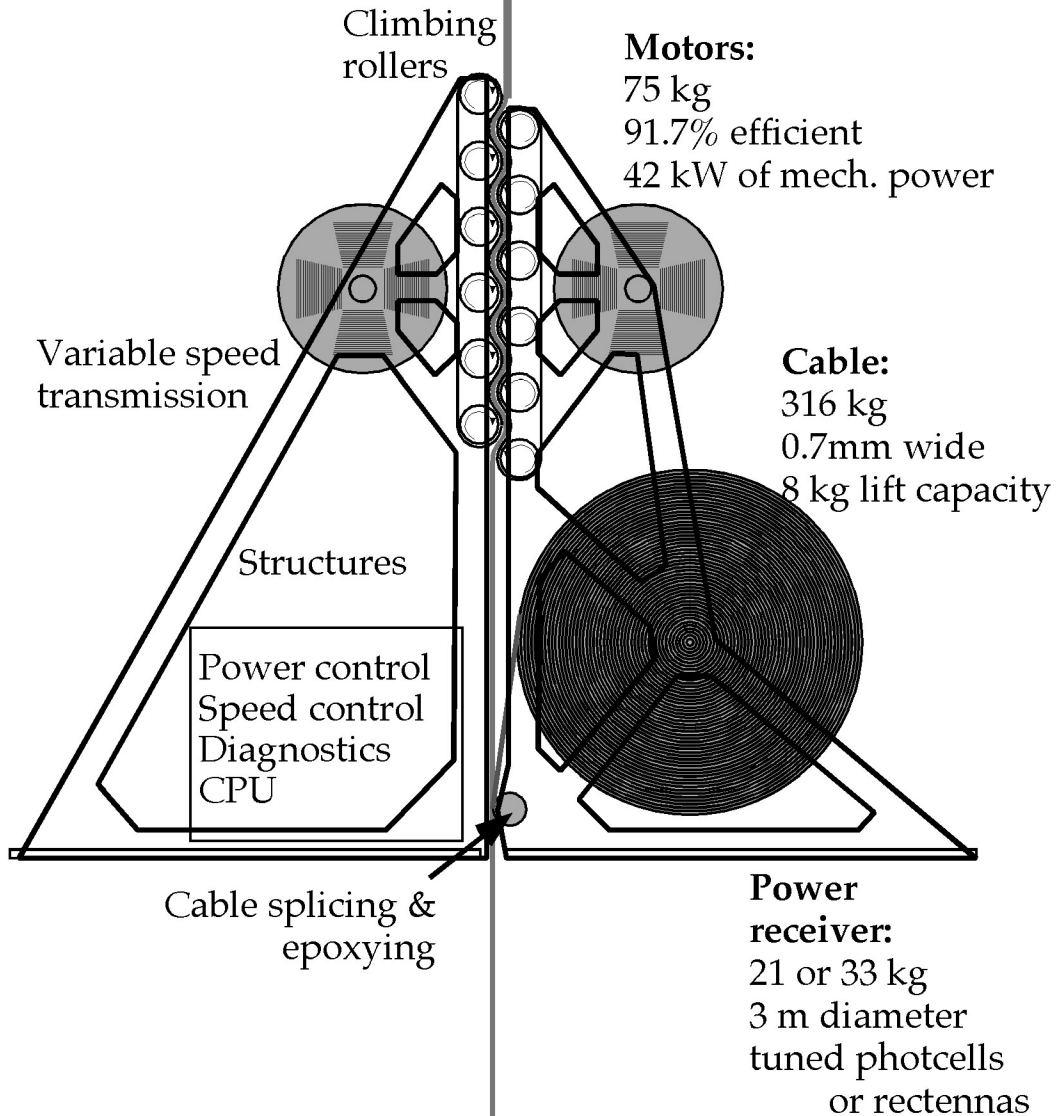
THE SPACE ELEVATOR



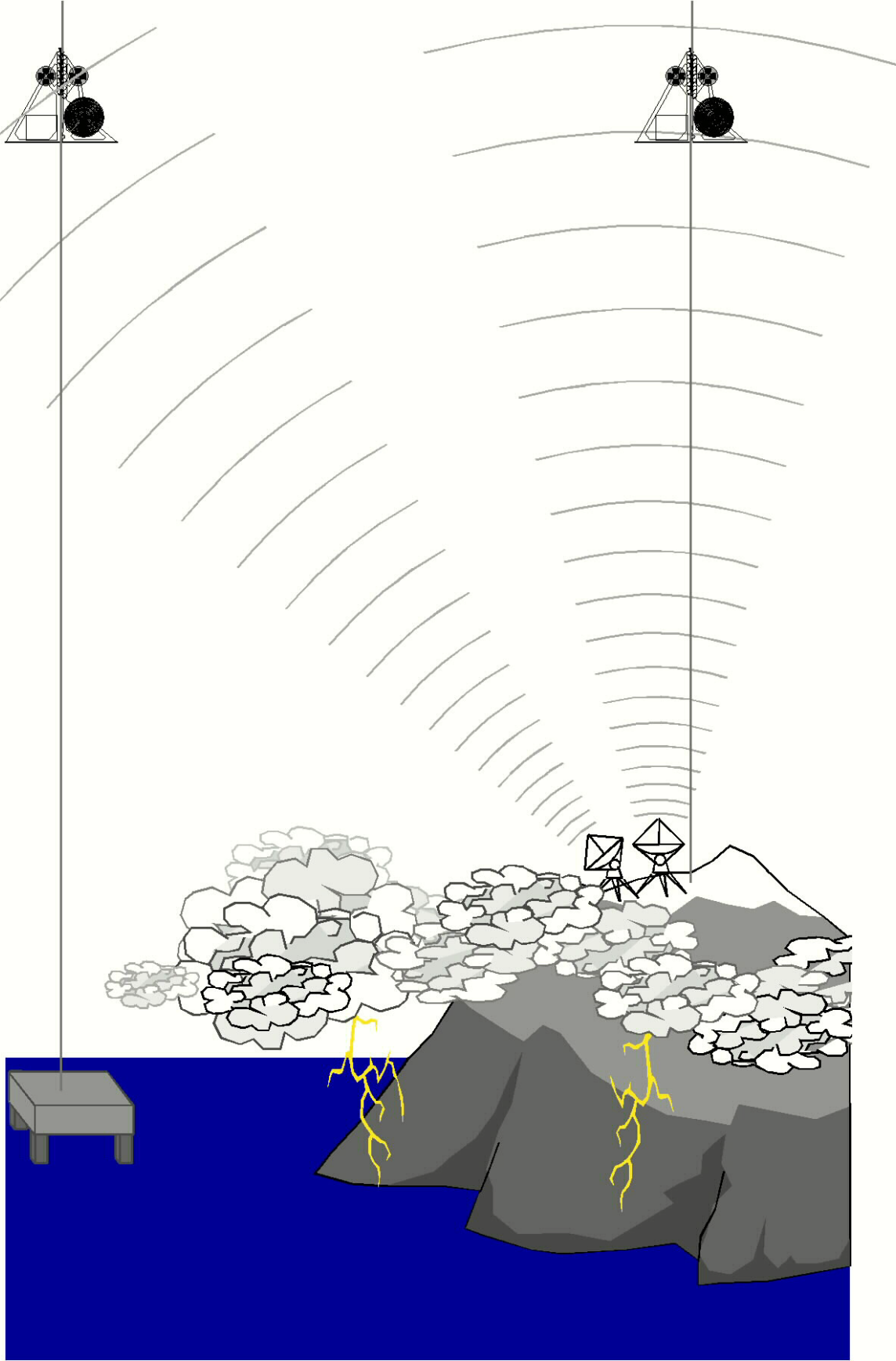
From Ren, Z. F., et al., *Science*, 1998, **282**, 1105.

THE SPACE ELEVATOR

Initial Climber: 528 kg



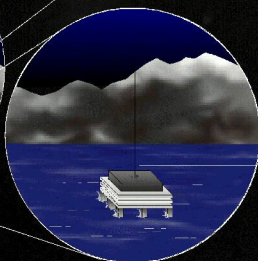
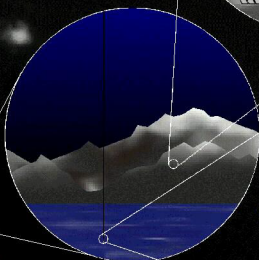
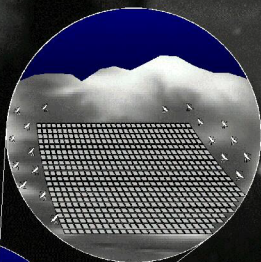
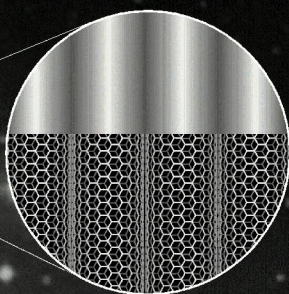
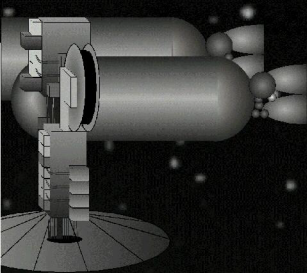
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Challenges

- Micrometeorite impacts on cable
- Low-earth orbit spacecraft impacts on cable
- Radiation and atomic O damage of cable
- Cable heating by induced electrical currents
- Natural frequency and oscillations in the cable
- Deployment locations
 - i. Power beaming
 - ii. Jet streams and cyclones
 - iii. Lightning
 - iv. Active avoidance
 - v. Optimal locations
- Risks of severed cables and malfunctioning climbers



THE SPACE ELEVATOR

Summary

- The Space Elevator is certainly fun to read about in science fiction (Fountains of Paradise, Red Mars, Green Mars, Blue Mars,...)
- The challenges to bring the Space Elevator to reality are substantial.
- A realistic scenario can be presented for construction of a Space Elevator.
- Technology is advancing quickly enough to conceive of building the Space Elevator in our lifetimes.
- The Space Elevator is no longer only in the realm of science fiction.