ISEC Research Activities

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ISEC Research Committee
Objectives

• Give advice to potential collaborators
• Ease the entry of new participants
• Promote a consistent set of assumptions between different projects
  – Based on the recent book – the IAA Study
• Conserve resources by avoiding duplication of research work
Not-for-Profit Foundation

• We hope to establish a Research Foundation
  – Directing funds from donors to promising areas of research
  – Selecting suitable teams to carry out the work
    • Universities or elsewhere
  – Overseeing projects with suitable checkpoints
  – Conducting peer reviews of completed subprojects
  – Deciding whether to renew funding
Topics Requiring Major Investment

- Tether materials development, testing and manufacture
- Tether climber design
- Tether climber power source
- High stage one

All involve laboratory or engineering work that produce materials or prototypes.
Topics Requiring Intermediate-level investment

• Tether dynamics
• Tether electrodynamics
• Radiation environment of the tether and climbers

All involve simulations producing tools for others to use
## Summary of Cost Estimates

**US$ thousands**

<table>
<thead>
<tr>
<th>Years from start:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tr>
<td>Tether Materials</td>
<td>1300</td>
<td>1400</td>
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<td>1300</td>
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<tr>
<td>Climber Design</td>
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<td>600</td>
<td>1400</td>
<td>1900</td>
<td>2600</td>
<td>2500</td>
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<td>Climber Power Source</td>
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<td>1000</td>
<td>1500</td>
<td>2600</td>
<td>10,900</td>
<td>20,800</td>
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<tr>
<td>High Stage One</td>
<td>610</td>
<td>510</td>
<td>320</td>
<td>1710</td>
<td>1580</td>
<td>590</td>
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<tr>
<td><strong>Total - Major</strong></td>
<td>2410</td>
<td>3510</td>
<td>4520</td>
<td>7510</td>
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<td>300</td>
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<td>Tether Electrodynamics</td>
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<td>500</td>
<td>740</td>
<td>800</td>
<td>560</td>
<td>400</td>
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<td>Radiation Environment</td>
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<td>560</td>
<td>760</td>
<td>780</td>
<td>600</td>
<td>400</td>
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<td><strong>Total - Intermediate</strong></td>
<td>860</td>
<td>1260</td>
<td>1800</td>
<td>2080</td>
<td>1960</td>
<td>1800</td>
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</table>
Unclassified Topics

- **Management**
  - Systems operations
  - Law
  - International policy
  - Marketing
  - Finance

- **Technology**
  - Hazards to tether and tether climbers
  - Hazards caused by the space elevator
  - Tether maintenance
  - Laser interference with existing satellites
  - Marine node design
  - GEO node design
  - Apex anchor design
  - Human/robotic trade-off
  - Comms mechanisms
Conclusion

• Consistent structure and style for research-topic descriptions
  – Teams and individuals capable of performing the work
  – Outline costings

• Rational basis for determining size and scope of a research program

• Accelerate progress towards realization of the first space elevator