Overview

- International robotic mission to the Moon’s south pole ~2024
- Deep drilling for science
- Investigating a future manned base
- Billion year archive of life on Earth
- Mass participation, funding and inclusive education
- Preliminary crowdfunding successful

“By drilling we will unlock billions of years of geological history related to the origin and evolution of the Earth-Moon system.”

Professor Ian Crawford, Department of Earth and Planetary Sciences, Birkbeck College, University of London
Context – Global Exploration Roadmap

- New phase in exploration underway
  - Moon, Mars and beyond
  - Mix of robotic & manned
  - International collaboration is key
- Commercial investment and management
  - Launchers & spacecraft
  - Complements government programmes
  - New funding models
- Increasing involvement of citizens

*Lunar Mission One advances these trends*
Technology

• Precision landing
• Deep drilling using pioneering wire-line technology, 20-100m
• Remote control robotics
• Commercial international consortium, to be negotiated
  – Technology development
  – Mission operations
• Spin-out opportunities eg: safer drilling on earth
Landing Sites

South Pole-Aitken Basin

- SPA will have exposed lower crustal and possible mantle material
- South pole lies just within the SPA
- Materials on the rim of Shackleton will likely sample this material.
Polar Volatiles

- 3µm absorption band: surficial OH, H2O (≤800 ppm; C. Pieters et al., Science, 326, 568 2009)
- In situ measurements required to determine thickness and composition and origin of these volatiles
Radio Astronomy

[Diagram showing atmospheric opacity and wavelength bands over time from Big Bang to Today]
Archive & Education

- Comprehensive record of Life on Earth
  - Human history and civilisation
  - Database of biosphere/environment
- Private information and DNA code
  - Basis for project funding
- Billion year survival
  - Exceptional preservation conditions
- Schools, worldwide
  - Archive/culture, science, technology
  - All cultures, ages, abilities
Private funding, public authority

• Private archive, consumers worldwide
  – Early reservations & club membership for enthusiasts
  – Later large scale global marketing, franchised local sales
  – $50-$500 typical, $1 low cost entry
• Revenue projection $ Billions
• Cost ~$1.5 Billion for space project and public engagement
• International Public Private Partnership
• All surplus to non-profit Trust for further space science & exploration

An enduring financial and educational legacy
Programme

• 3 year procurement of main contracts – Setup Stage
  – Mission + revenues + instruments
  – In parallel: early revenues + pilot schools programme
• 6 year main development
  – Commercial mission management under government authority
  – Global sales & marketing campaign + education programme
• 6 months lunar operations
• On success, second mission for sample return
Science Working Groups

• Science requirements
• Landing site selection
• Instruments
• Robotics
• Archive materials

Expecting significant international working, mainly US
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