Association of Space Explorers
NEO Hazard Update

Progress Report to COPUOS STSC

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Hayabusa Return
Overview

• Introduction

• ASE NEO Hazard Decision-Making

• Results: Mission Planning & Operations Group Workshop

• Opportunities for International NEO Cooperation
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ASE NEO Decision-Making Process

• Authored by ASE Panel on Asteroid Threat Mitigation, 2007-2008

• “Asteroid Threats: A Call for Global Response”
  • http://space-explorers.org/committees/NEO/neo.html

• International Process for NEO Decision-Making

• Functional Diagram for NEO Response Process
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United Nations Security Council

MAOG
Mission Authorization and Oversight Group

IAWN
Information, Analysis, and Warning Network

MPOG
Mission Planning and Operations Group
ASE NEO Decision-Making Process

- “Asteroid Threats: A Call for Global Response”
  - http://space-explorers.org/committees/NEO/neo.html

- Submitted to COPUOS in 2009

- COPUOS STSC Provides Template for Framework and Future Agreement

- Follow-up Workshops to Define NEO Decision-Making Process
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ASE Co-sponsored NEO Workshop Series, with:

- Secure World Foundation
- Foreign Ministry, Mexico
- Regional Centre for Space Science and Technology Education for Latin America and the Caribbean
- European Space Agency
- IAWN Workshop (Mexico City, January 2010)
- MPOG Workshop (Darmstadt, October 2010)
MPOG Proposed Role:

- Information Requirements Enabling Planning & Operations
- Deflection Decision & Event Timing
- Evaluate Deflection Concepts
- Cost Models
- Help MAOG Identify Operations Process
MPOG Workshop Executive Summary Findings

1. MPOG-like group should be established by space agencies
2. Identify to space agencies the technical issues to be explored for planetary defense
   - Create synergies among international programs and activities
   - e.g. planetary defense, science, exploration
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MPOG Workshop Executive Summary Findings

3. Propose NEO Research Objectives to Guide Space Agencies
   • Addressing critical areas for effective NEO deflection strategies

4. Recognized value of finding hazardous NEOs early
   • Identify threats
   • Obtain precision tracking for decision making
   • Averts costs of future deflection missions
   • Strategy requires upgraded search capability
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Forward Work on NEO Decision-Making

- COPUOS should now endorse the formation and work of IAWN and MPOG
- Support from member states, space agencies
- Mission Authorization and Oversight Group
  - Multi-lateral discussions at COPUOS among member states, agencies
- Member States & Agencies Cooperate on Technical Research and Programs to Inform Decision-Making
Opportunities for Further Progress

• Agencies can organize for Planetary Defense

  • Recommendations of NASA ad hoc Task Force
    • Organize, Search, Characterize, Respond, and Lead
  • Highlights: Space-based Search Telescope
  • Last-Minute Warning for Small NEO Impacts
  • International Deflection Mission

http://www.nasa.gov/pdf/490945main_10-10_TFPD.pdf
Thousands of objects that could take 10 to 20 years to see from Earth

Poor detection efficiency from Earth

Nominal search region available from Earth

Search region available for the NEO Survey Observatory

Represented orbits are to scale
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2008 TC3
Conclusions

- COPUOS STSC Has Come Far on NEO Hazard
- Global Nature of NEO Hazard Requires Cooperation
- COPUOS Members Should Approve, Support, and Enable the Work of NEO IAWN and MPOG
- ASE’s Network of Space Explorers Will Continue to Assist, Educate, Communicate, and Encourage
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Helping Turn the NEO Hazard into Opportunity

http://www.space-explorers.org