

ASE Decision Program

ASE Decision Program for Asteroid Threat Mitigation



**Status Report to
AT 14
COPUOS STSC**

Thomas D. Jones, PhD

tj@space-explorers.org

Vienna, Austria

18 Feb 08



ASE Decision Program

Overview

- ASE NEO status report to COPUOS
- ASE NEO Workshop results
- Draft Program Intro and Contents
- ASE UN Reporting
- ASE NEO Future Activities and Outreach





ASE Decision Program

ASE update to COPUOS: June 2007

- ASE presented a summary of our workshop process
- Stated our intention to present a draft Program in February 2009.
- This effort was recognized by Action Team 14 (dealing with NEOs)
- COPUOS officially aware of ASE effort
- ASE's Program submission now part of planned NEO initiative by COPUOS.



ASE Decision Program

ASE NEO Workshop Series

- Series of 4 workshops on NEO decision-making
- ASE Panel on Asteroid Threat Mitigation (PATM)
- Principals selected for expertise, independence from national space institutions
- Not associated with government space agencies or business interests
- List





ASE Decision Program

PATM Principals

Adigun Ade Abiodun
Vallampadugai Arunachalam
Roger Bonnet
Sergio Camacho-Lara
James George
Tomifumi Godai
Nandasiri Jasentuliyana
Peter Jankowitsch
Sergey Kapitza

Paul Kovacs
Walther Lichem
John Logsdon
Gordon McBean
Martin Rees
Karlene Roberts
Roald Sagdeev
Michael Simpson
Crispin Tickell
James Zimmerman



ASE Decision Program

Invited PATM Observers

- Dr. Richard Tremayne-Smith former Chairman, AT-14
- Dr. Richard Crowther Rutherford-Appleton Lab, AT-14
- Dr. Mazlan Othman Director, OOSA



ASE Decision Program

PATM Tasks

- Draft Program documents
- Advise on formal delivery to UN COPUOS
- Provide pathways to international institutions, governments, space agencies
- Aid our communication efforts with public





ASE Decision Program



ASE NEO Workshop 1 – May 2007

- International Space Univ., Strasbourg, France
- Educate Panel Principals on NEO impact process
- World-class experts delivered tutorials to give all Panel members common hazard understanding
- Subjects: NEO basics, orbital dynamics, detection programs, deflection, impact effects, space law, UN COPUOS functions, natural disasters
- Approval of effort to prepare a draft Program



ASE Decision Program

NEO Workshop 2 – September 2007

- Sibiu, Romania (Host: Dorin Prunariu)
- PATM created first draft of ASE Decision-Making Program for Asteroid Threat Mitigation
- Goal: NEO impact “Mission” or “Flight Rules” (Russian “Red Book”)
- Addressed: NEO detection, data exchange, communication, disaster planning, new UN structure to handle NEO planning, indemnification, UN NEO “actor”, costs
- Developed roadmap for submission, publication, and communication of Decision-Making Program



ASE Decision Program

Draft Program on Asteroid Threat Mitigation

- Introduction
 - Likely Warning Times
 - Critical Aspect of Timely Warning
 - Impact and Decision Frequency
 - Need for International Agreement
- Table of Contents
 - Discussing 3 major UN NEO subgroups
 - International legal framework
 - Recommended way forward for UN deliberation
- Draft Program completion scheduled for Workshop 3 (Apr)





Outstanding Issues

1. Who “resolves” deltas in impact solutions of JPL, NEODyS, and future national NEO tracking entities? (IAW & P&O)
2. Do we need to create a single "official" risk table and impact solutions database? (IAW & P&O)
3. Do MPC (and JPL, NEODyS, etc.) need a committed funding base? Who funds? Member state tax? If UN funded, do national entities, and IAU (for MPC) retain control? (P&O)
4. Is there a difference between the alert and warning threshold (3 MT?) and the minimum threshold for a deflection campaign? (i.e. opt for mitigation instead of mounting a deflection campaign? (cost effectiveness argument?) (All)
5. Is risk corridor official public information? If so, at what threshold of risk, or other criteria? (P&O)
6. Is a mitigation alert or warning issued (by IAW) based only on threshold definitions or is formal authorization required? And by whom?
7. Who decides/approves deflection campaign initiation? Assuming threshold criteria are specified, is action thereafter automatic? Or is proactive direction/authorization required? By whom?



ASE Decision Program

- NEO Workshop 3 – 23-26 April 2008
 - Earth University, Guácimo, Costa Rica
 - Complete drafting of PATM Program
 - Edit for priority issues, content, clarity
- NEO Workshop 4 – 22-25 Sep 2008
 - San Francisco, Calif. area
 - Final edits, adoption of Program
 - Signatures, submission to AT 14



ASE Decision Program



ASE NEO Committee Future Activities

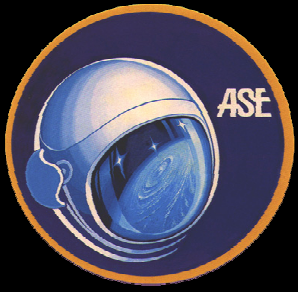
- ASE status report to COPUOS STSC – Feb 08
- ASE NEO Workshop 3 – April 2008, Costa Rica
- ASE status report to UN COPUOS, June 2008
- ASE NEO Workshop 4 – Sep 2008
- Transmit Program document to AT-14 – Sep 08
- ASE global information briefings – late 2008-2009
- ASE submits to UN COPUOS AT-14 – Feb 09
- ASE supports full COPUOS discussion – Jun 09



ASE Decision Program

ASE NEO Committee -- Communications

- No release of Program content to press before Workshop 4 -- Sep 2008
- ASE NEO Program communication effort:
 - Briefings to world space agencies
 - Trans-national institutions (IAF, COSPAR)
 - UN: AT-14, COPUOUS, General Assembly
 - Published articles and lectures
 - Tunguska centennial
 - Future NEO close encounters
 - Internet, video and film



ASE Decision Program



Tunguska Centennial: June 30, 2008



ASE Future Work on NEO Hazard

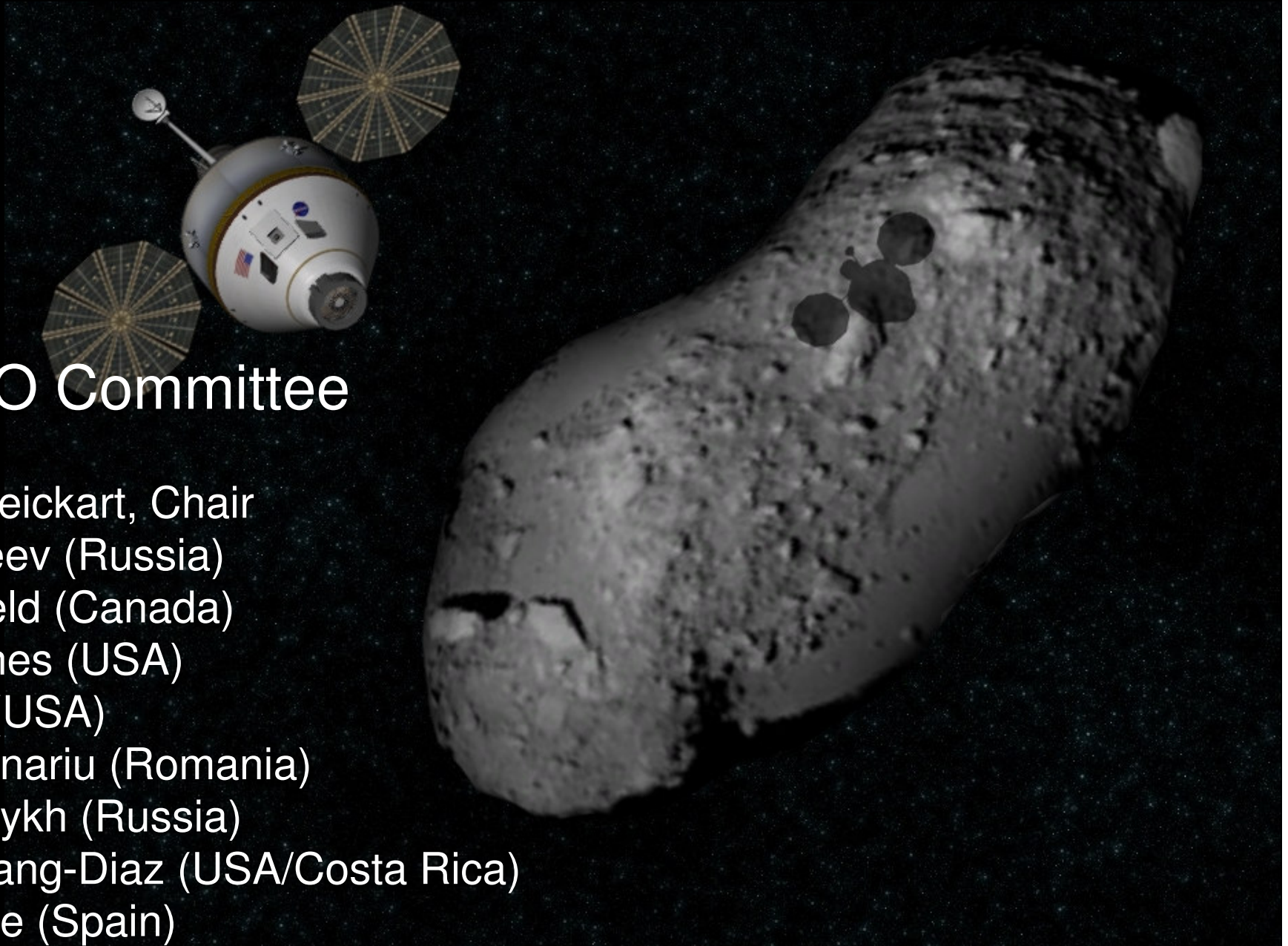
Events to watch

- Workshop progress
- Press coverage (e.g. Tunguska, Peru, 2007 WD5)
- ASE NEO Committee web site:
<http://www.space-explorers.org/committees/NEO/neo.html>
- University of Nebraska (Lincoln, NE) Conference
"Near Earth Objects: Risks and Opportunities"
 - late April 2009
 - contact Frans von der Dunk



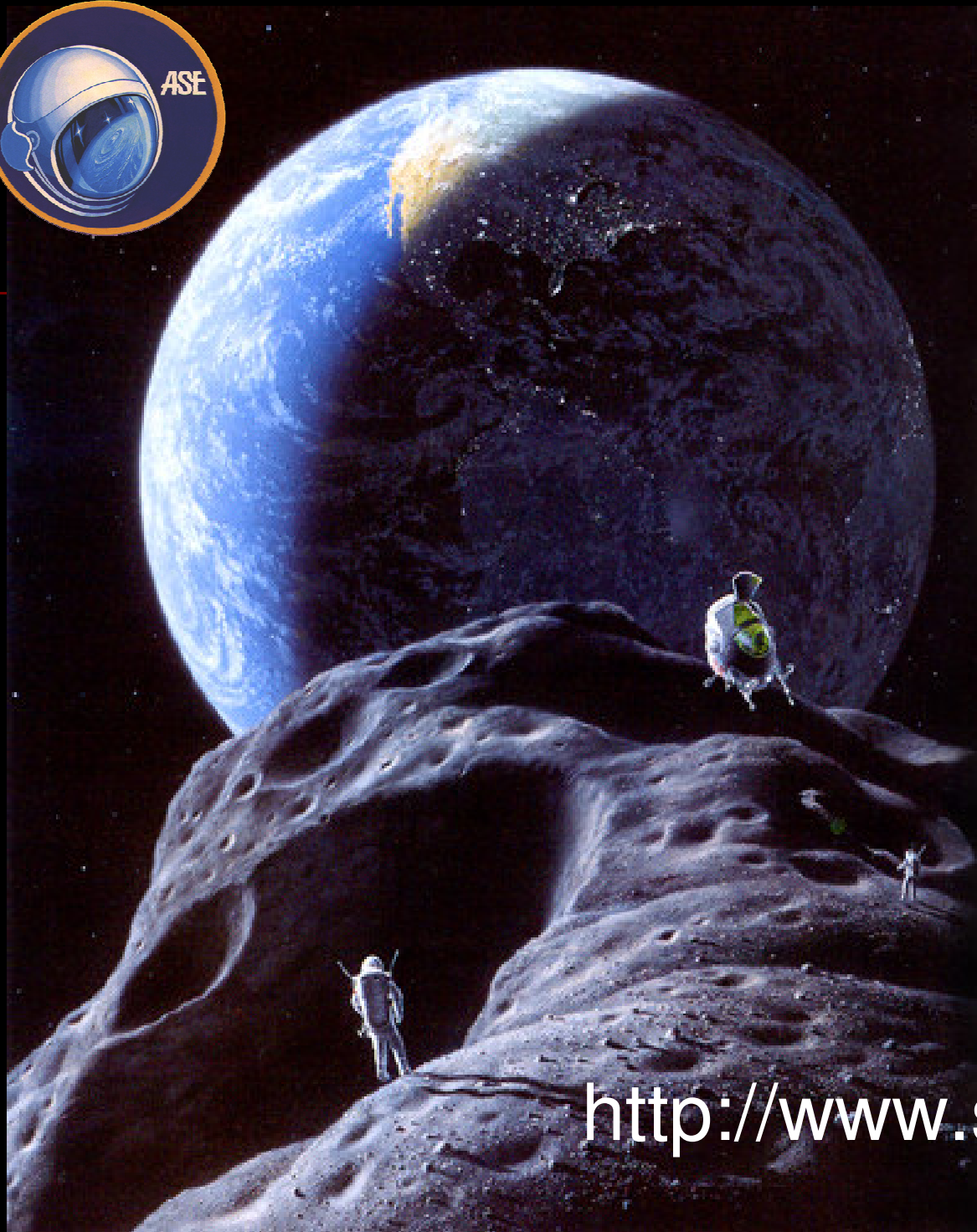


ASE Decision Program



ASE NEO Committee

Rusty Schweickart, Chair
Sergei Avdeev (Russia)
Chris Hadfield (Canada)
Thomas Jones (USA)
Edward Lu (USA)
Dumitru Prunariu (Romania)
Viktor Savinykh (Russia)
Franklin Chang-Diaz (USA/Costa Rica)
Pedro Duque (Spain)



ASE:

**Turning NEO
Hazard into
Opportunity**

<http://www.space-explorers.org>



ASE Decision Program

List of Invited Principals

- Dr. V.S. Arunachalam, Chairman, Center for Study of Science, Technology and Policy
- Dr. Roger-M. Bonnet, President, Committee on Space Research (COSPAR)
- Ambassador James George, Retired, Canada
- Dr. Tomifumi Godai, former President, International Astronautical Federation
- Ambassador Peter Jankowitsch, Retired, Austria
- Dr. Nandasiri Jasentuliyana, President, International Institute of Space Law
- Dr. Sergei Kapitza, Russian Academy of Sciences
- Mr. Paul Kovacs, Executive Director, Institute for Catastrophic Loss Reduction
- Ambassador Walther Lichem, former Austrian ambassador to Canada
- Dr. John Logsdon, Director, Space Policy Institute, GWU
- Dr. Gordon McBean, ICSU Planning Gp. on Natural and Human-Induced Env. Hazards
- Lord Martin Rees, President, The Royal Society
- Dr. Karlene Roberts, Professor, Haas School of Business
- Dr. Roald Sagdeev, Professor, University of Maryland
- Dr. Michael Simpson, President, International Space University
- Sir Crispin Tickell, Director, Policy Foresight Program, James Martin Institute, Oxford
- Jim Zimmerman, President, International Astronautical Federation
- Dr. Sergio Camacho-Lara, Director, UN Office for Outer Space Affairs

Invited Observers

- Dr. Richard Crowther, Rutherford-Appleton Laboratory, COPUOS AT 14 (NEO)
- Mr. Richard Tremayne-Smith, Chairman,