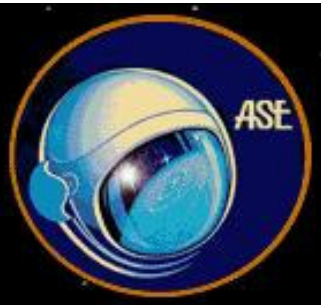
Association of Space Explorers

Presentation to 44th Session
Scientific and Technical Subcommittee
UN Committee on Peaceful Uses of Outer Space
21 February 2007

Deflecting NEOs: A Pending International Challenge

Rusty Schweickart
Chairman, NEO Committee
Association of Space Explorers



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The Three Components of Protection of the Earth from NEO Impacts

- ✓ Early Warning
- ✓ Proven Deflection Capability
- ✓ International Decision-making Protocol

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The ASE takes the position that…

1. The United Nations is the appropriate decision maker
2. An adopted treaty or protocol specifying the decision process must be in place as soon as possible
3. The information on NEOs provided by member states must support this negotiated decision process

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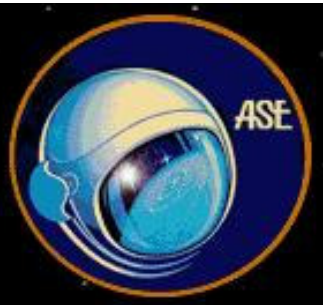
1. Why the United Nations?
2. What's the hurry?
3. What information is critical?



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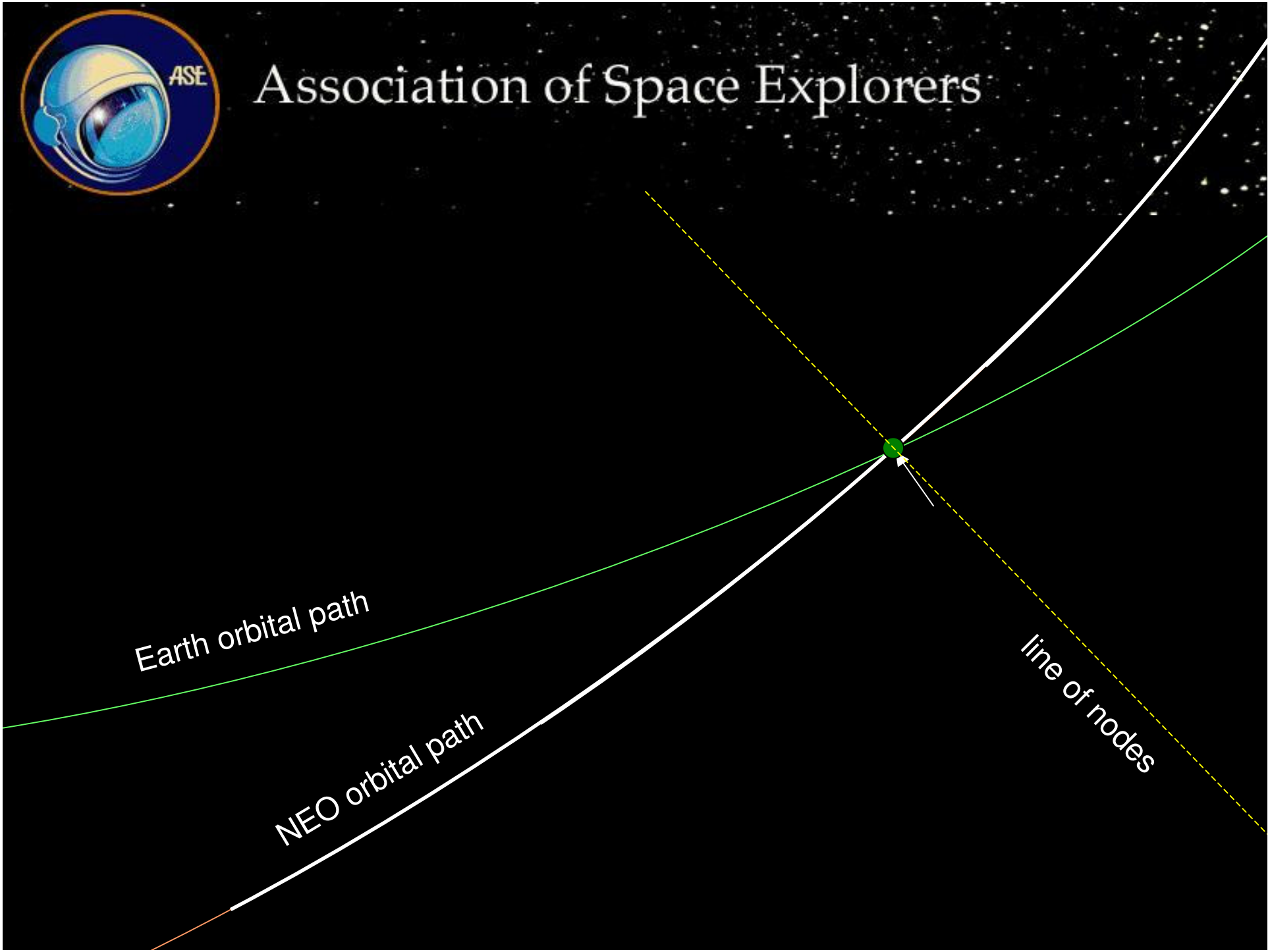
Looking at the NEO challenge from
the point of view of a decision maker

And

Using Apophis as an example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ASE
Earth orbital path
NEO orbital path
line of nodes

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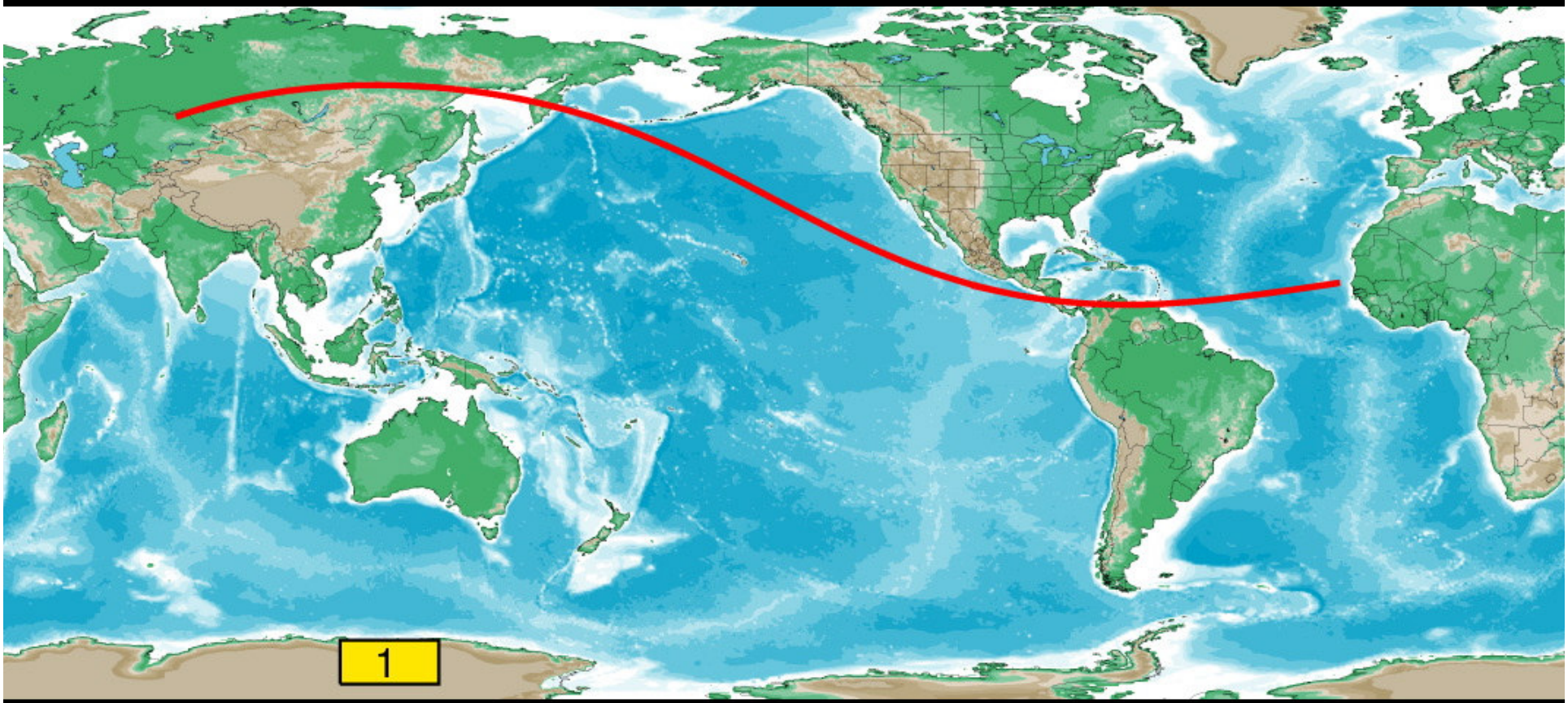

2007 - Path of Risk for Apophis

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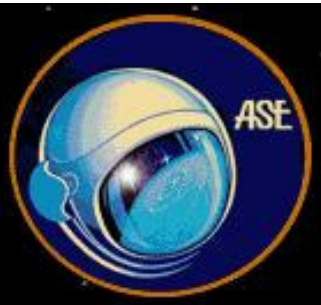
2020 - Paths of Risk for NEOs of Concern



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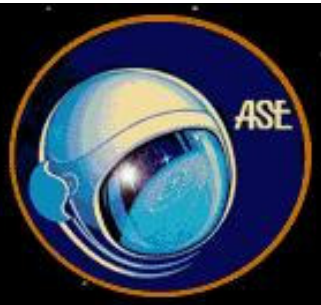
Decision Timing & Information Quality

- ✓ By when does the deflection have to be completed? (i.e. Deflection time)
- ✓ By when does a decision to act have to be made? (i.e. Decision time)
- ✓ What is the quality of the information available to make this decision? (And, is it good enough?)



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Deflection Time

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Current Deflection Capability

Kinetic Impact

Pushes the asteroid via direct impact

Gravity Tractor

Pulls the asteroid using mutual gravity as a tow-rope

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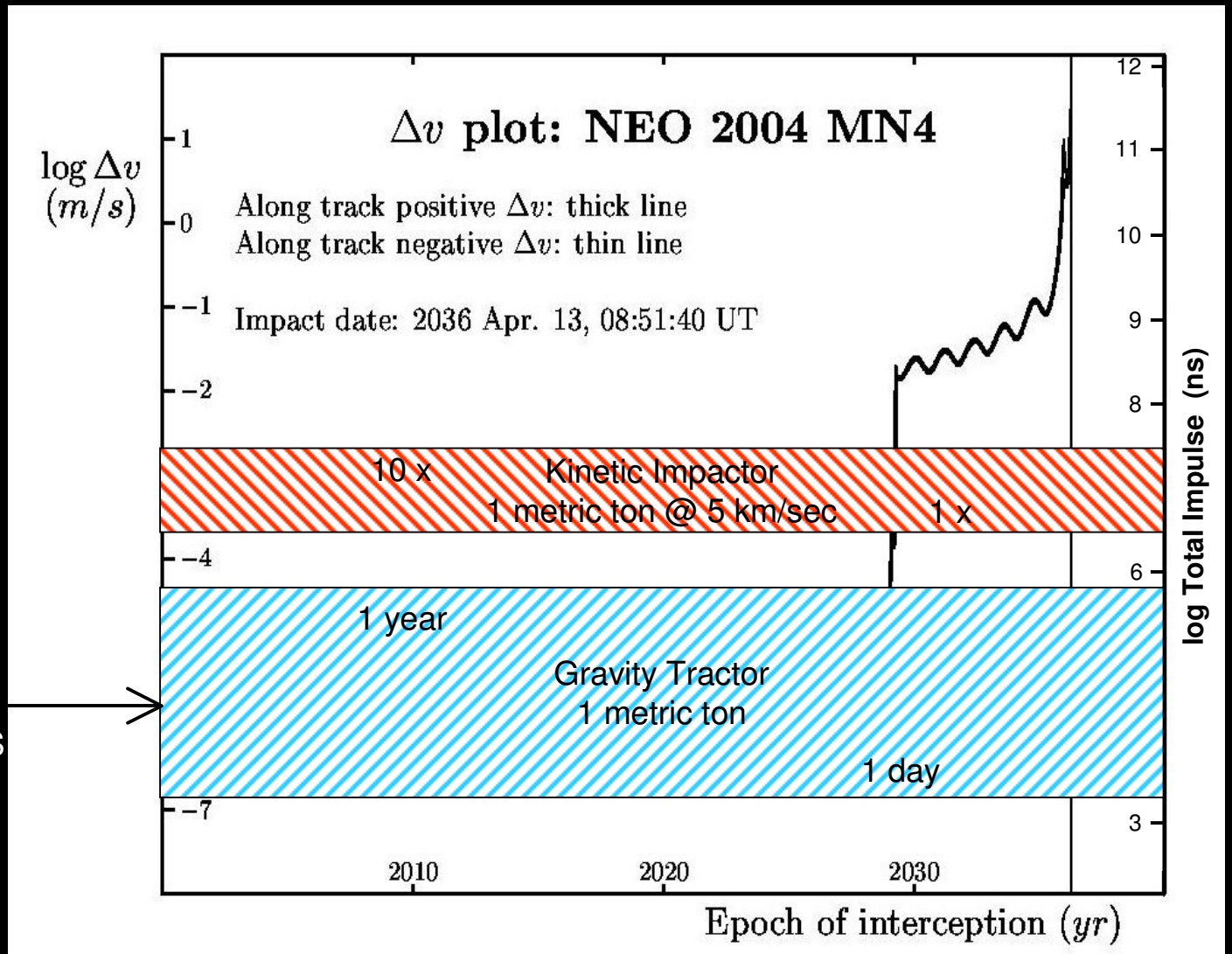
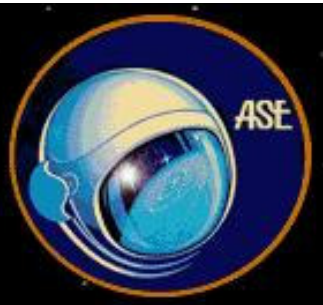
Deflection Time



12.2 days
@ 0.04 N
= 42,160 NS



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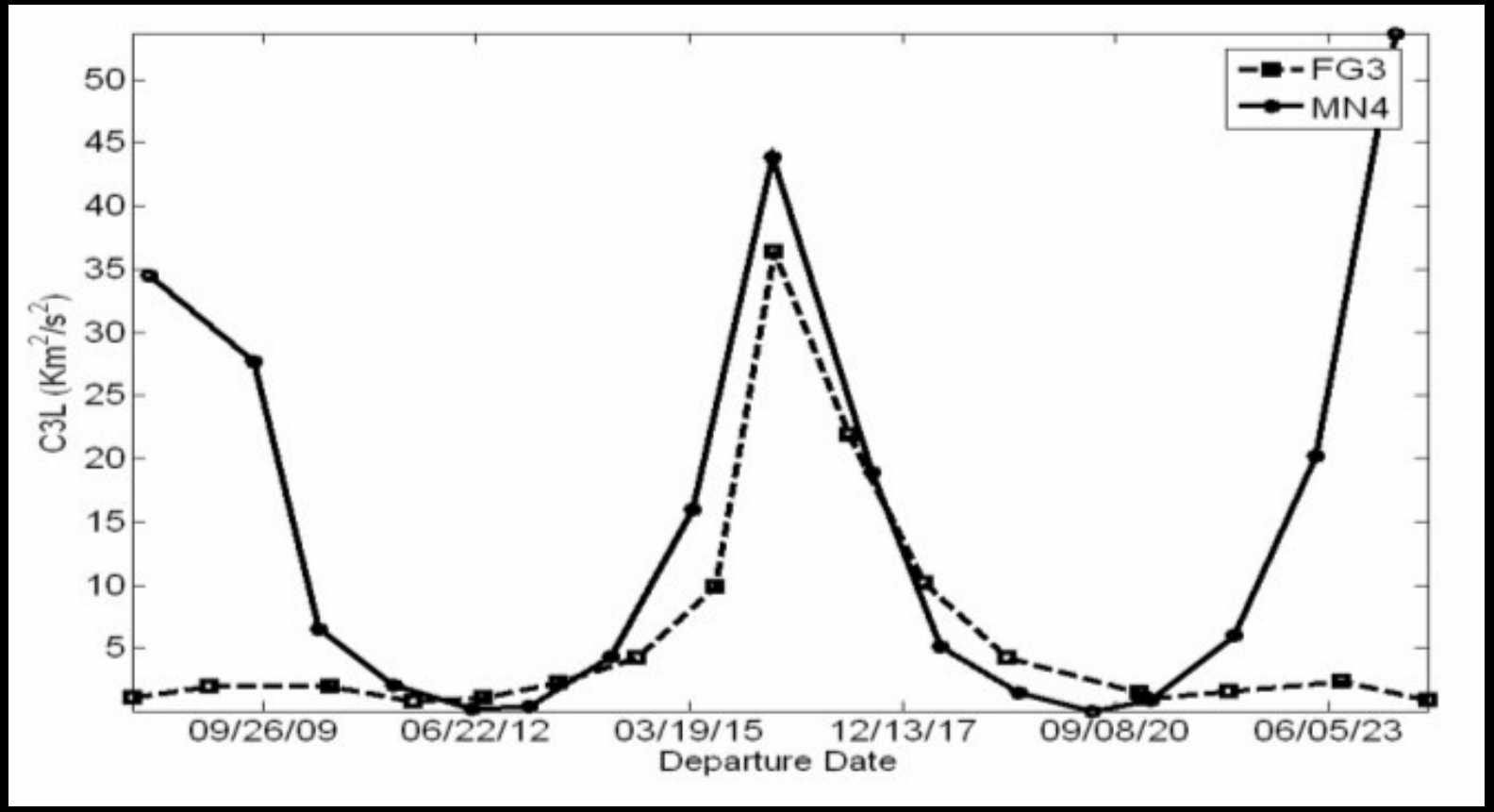
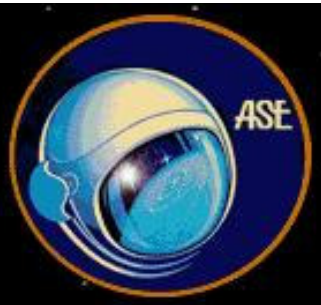
Decision Time

Decision Time





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Quality of Information

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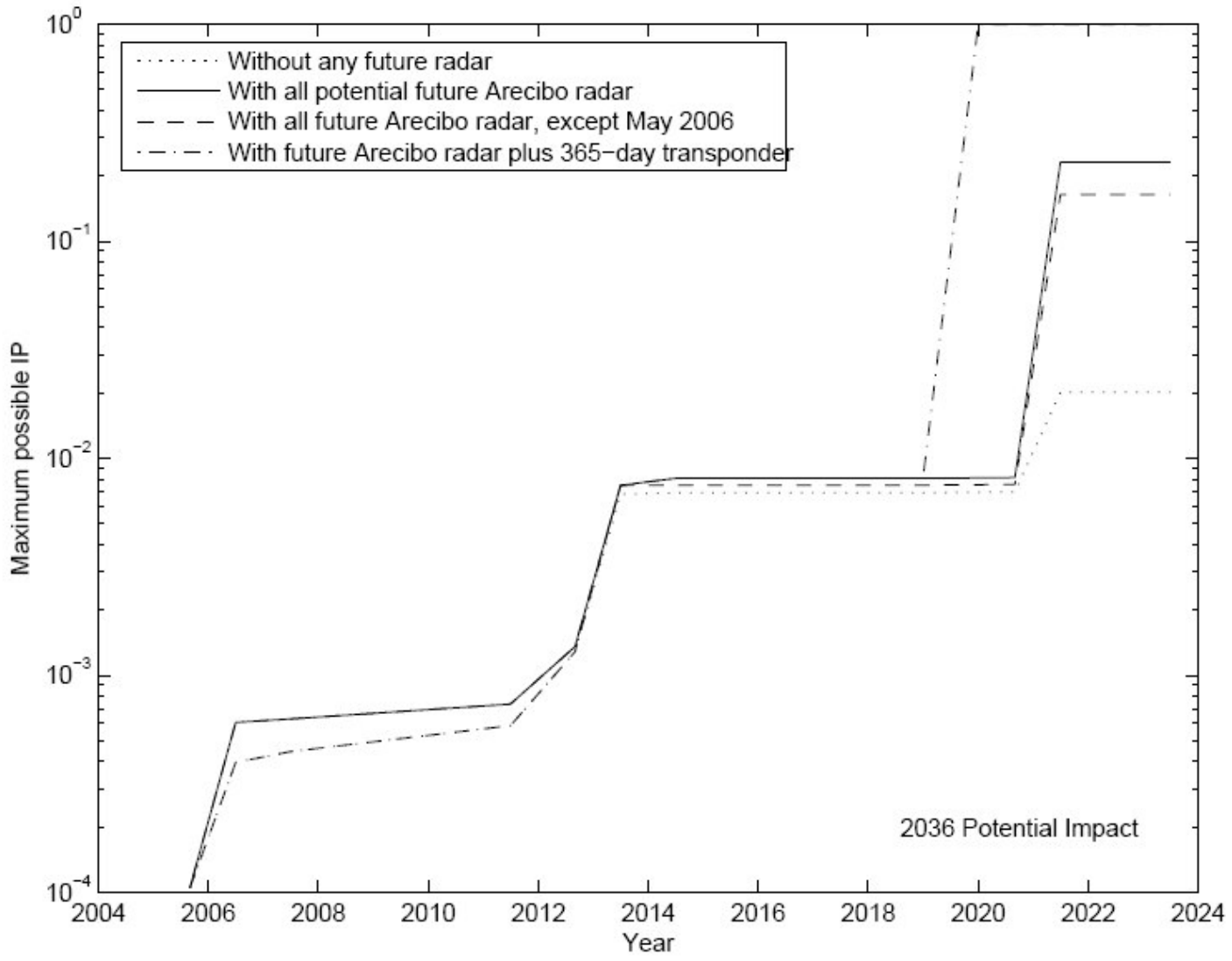
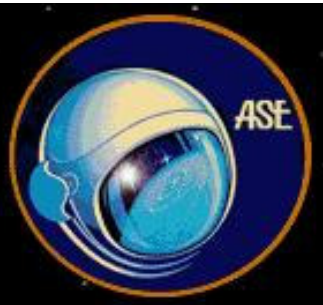


This type of analysis must be done for each NEO of significance in order to adequately inform the international decision process



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ASE Conclusions

The Association of Space Explorers believes that the development of an International NEO Deflection Protocol is critical to the protection of life and property from the devastation of a NEO impact.

We further believe that the United Nations is the appropriate international organization which should ultimately sanction such a protocol, and that COPUOS should assume the lead in preparing this instrument.

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To Facilitate the Development of Such a Protocol the ASE will..

Bring together a group of world diplomatic, legal and other experts in a series of 4 workshops to identify, develop, and ponder the many issues associated with a pending NEO impact. (First workshop scheduled for 9-12 May, 2007, Strasbourg, France)

Generate, as a workshop product, a draft United Nations Treaty (or Protocol) on NEO Deflection.

Deliver this draft treaty to the United Nations Committee on Peaceful Uses of Outer Space in their spring session in 2009, for further deliberation, debate, and (hopefully) adoption.

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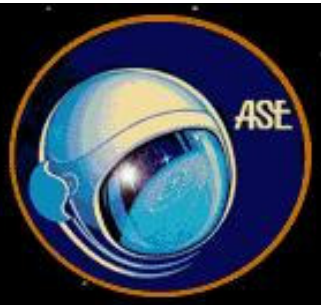
ASE-NEO Workshop Invited Principals

Dr. Roger-M. Bonnet, President, Committee on Space Research (COSPAR)
Ambassador James George, Retired, Canada
Dr. Tomifumi Godai, Chairman, Soranokai, Japan
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
Dr. John Logsdon, Director, Space Policy Institute, GWU
Lord Martin Rees, President, The Royal Society
Dr. Karlene Roberts, Haas School of Business, Risk Analysis & Mitigation
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



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Thank You