Association of Space Explorers

COPUOS

52nd Session

4 June 2009

Asteroid Threats:
A Call for Global Response

Rusty Schweickart
Chairman, ASE-NEO Committee

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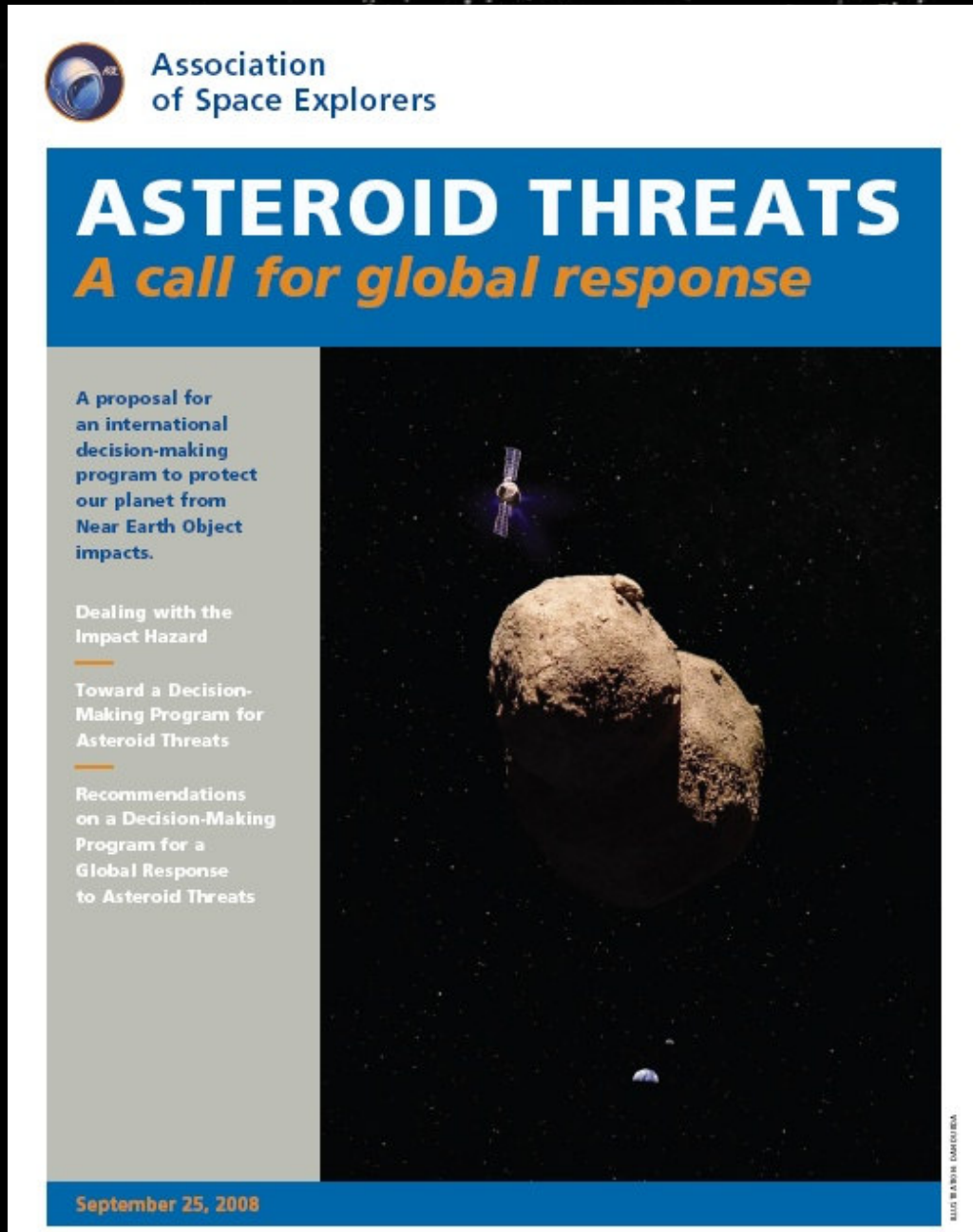
A Decision Program re NEO threats, submitted to the UN by the ASE and its international Panel on Asteroid Threat Mitigation

Presented to STSC in February 09 and being coordinated within COPUOS by Action Team-14



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Members of the ASE Committee on Near Earth Objects

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)

Members of the Panel on Asteroid Threat Mitigation

Adigun Ade Abiodun, Nigeria
Vallampadugai Arunachalam, India
Roger-Maurice Bonnet, Switzerland
Sergio Camacho-Lara, Mexico
James George, Canada
Tomifumi Godai, Japan
Peter Jankowitsch, Austria
Sergey Kapitza, Russia
Paul Kovacs, Canada
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Michael Simpson, United States
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Richard Tremayne-Smith, United Kingdom
Frans von der Dunk, Netherlands
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September 08, San Francisco

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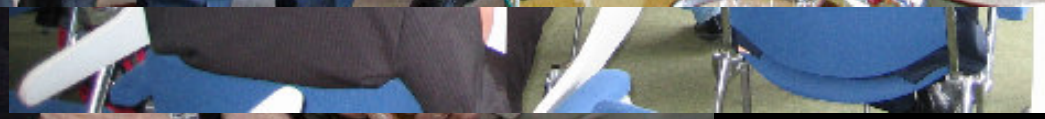

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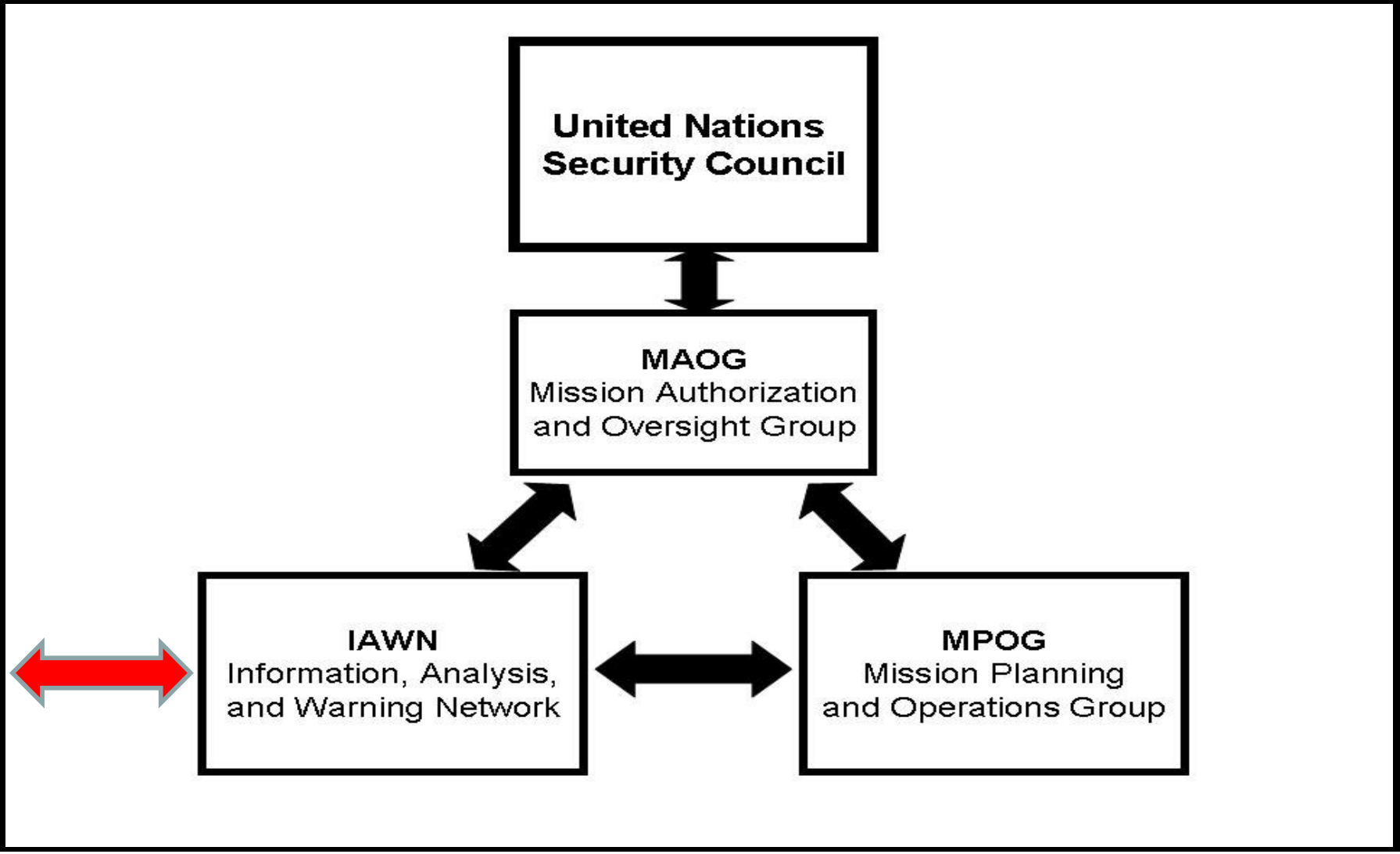
Key Recommendations
Defined functional responsibilities



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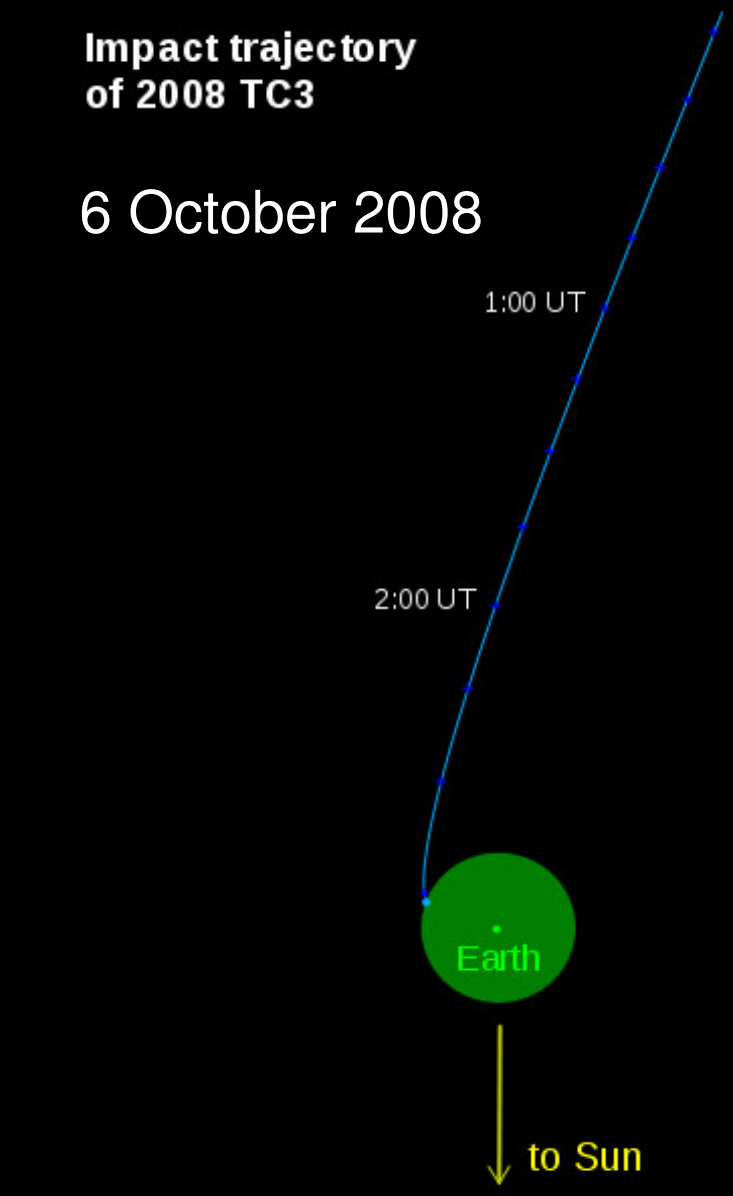
Impact trajectory of 2008 TC3

6 October 2008



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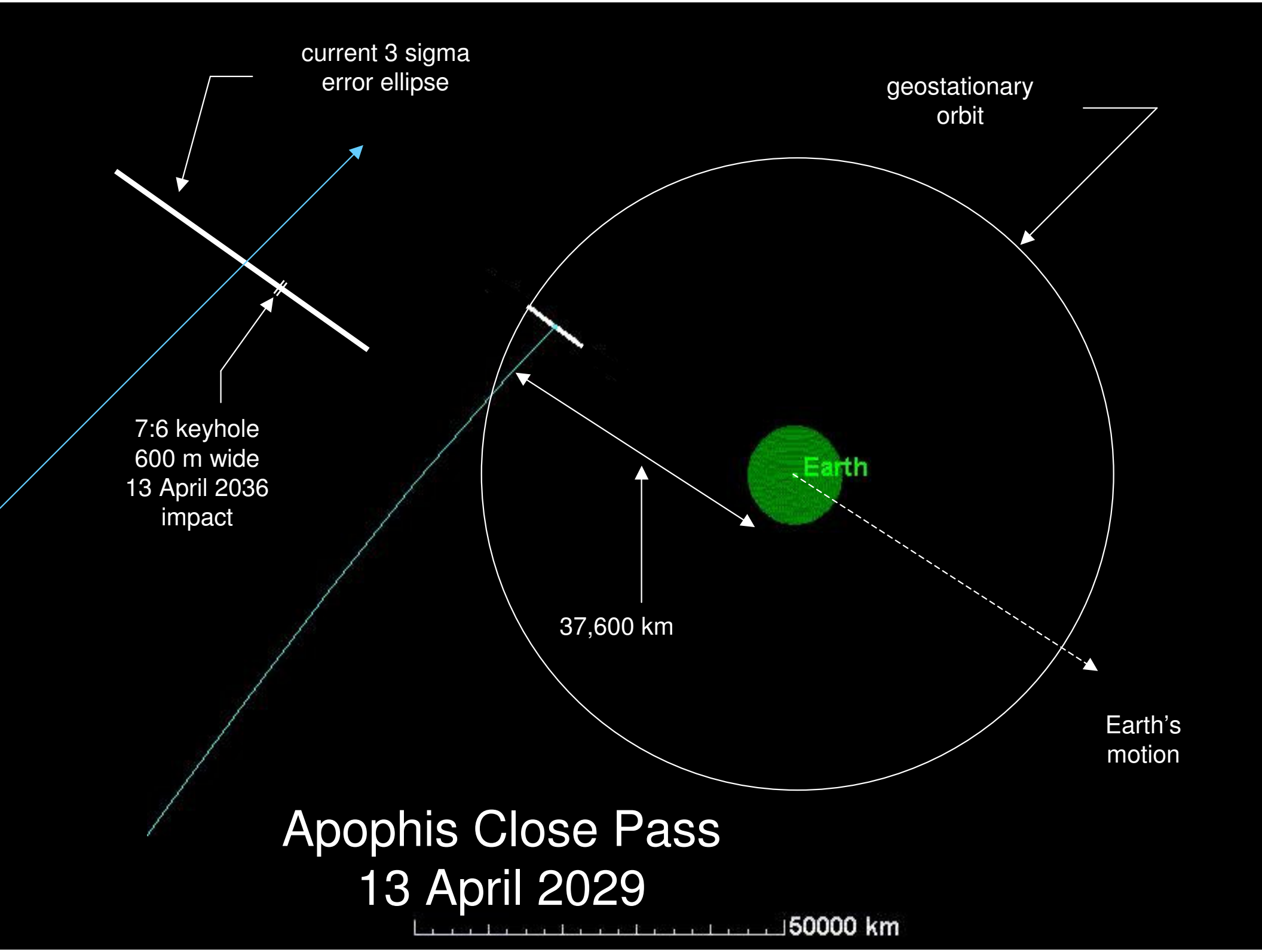
current 3 sigma
error ellipse
geostationary
orbit
7:6 keyhole
600 m wide
13 April 2036
impact
Earth
37,600 km
Earth's
motion
Apophis Close Pass
13 April 2029
50000 km

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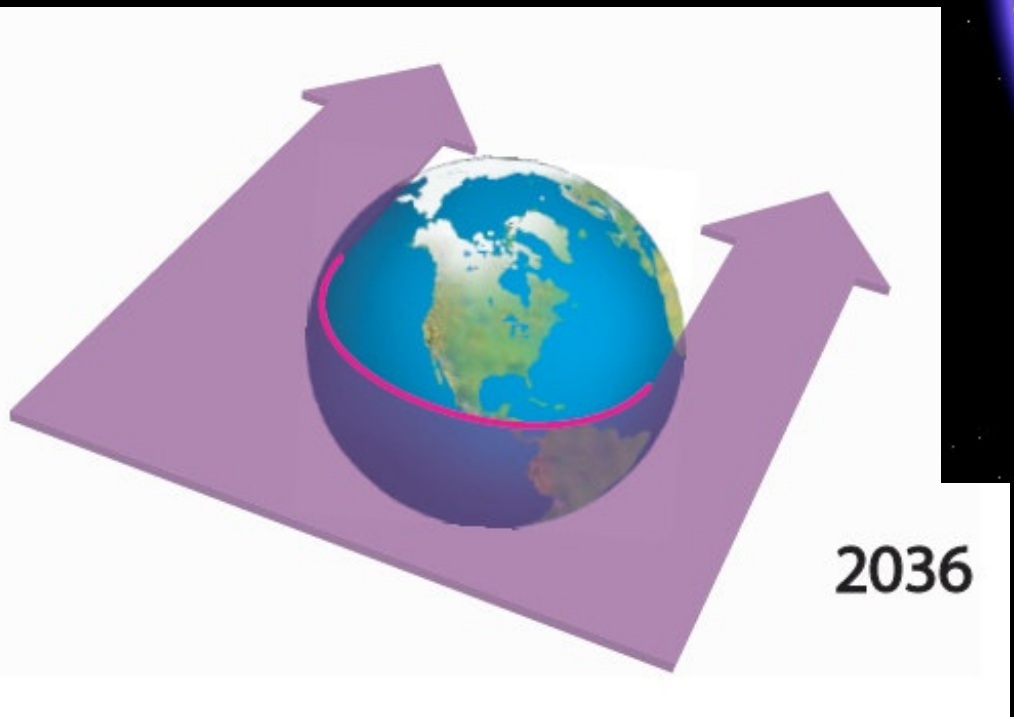
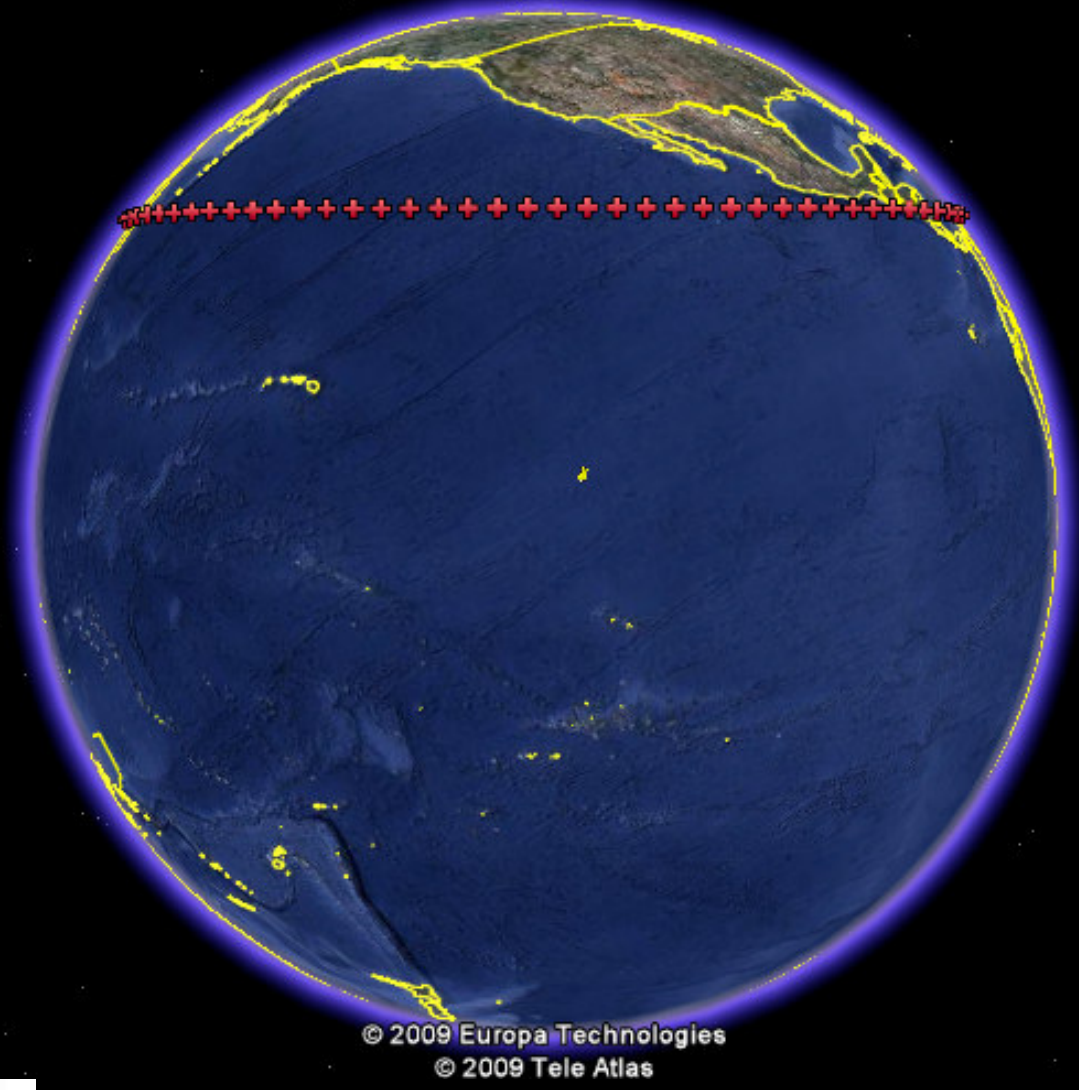
Apophis Risk Corridor





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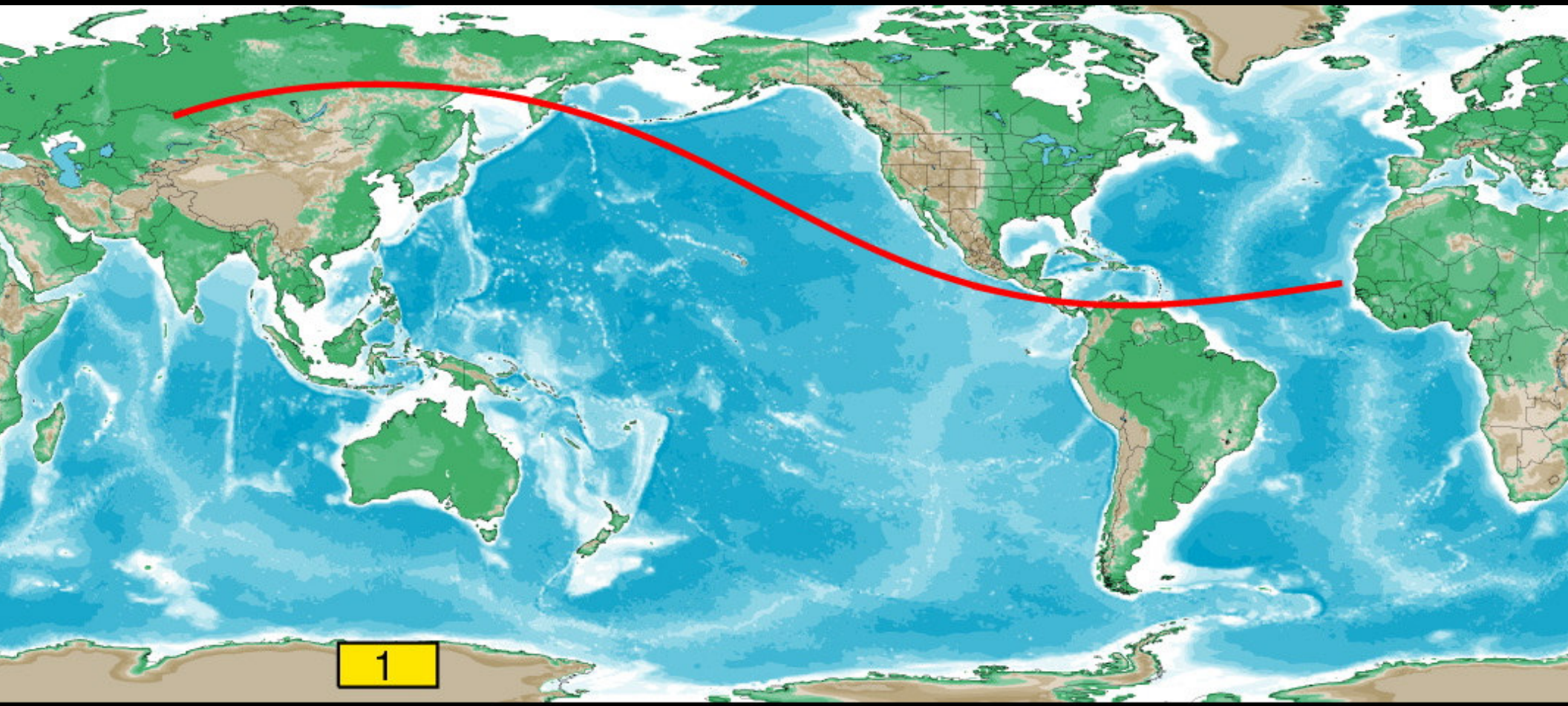
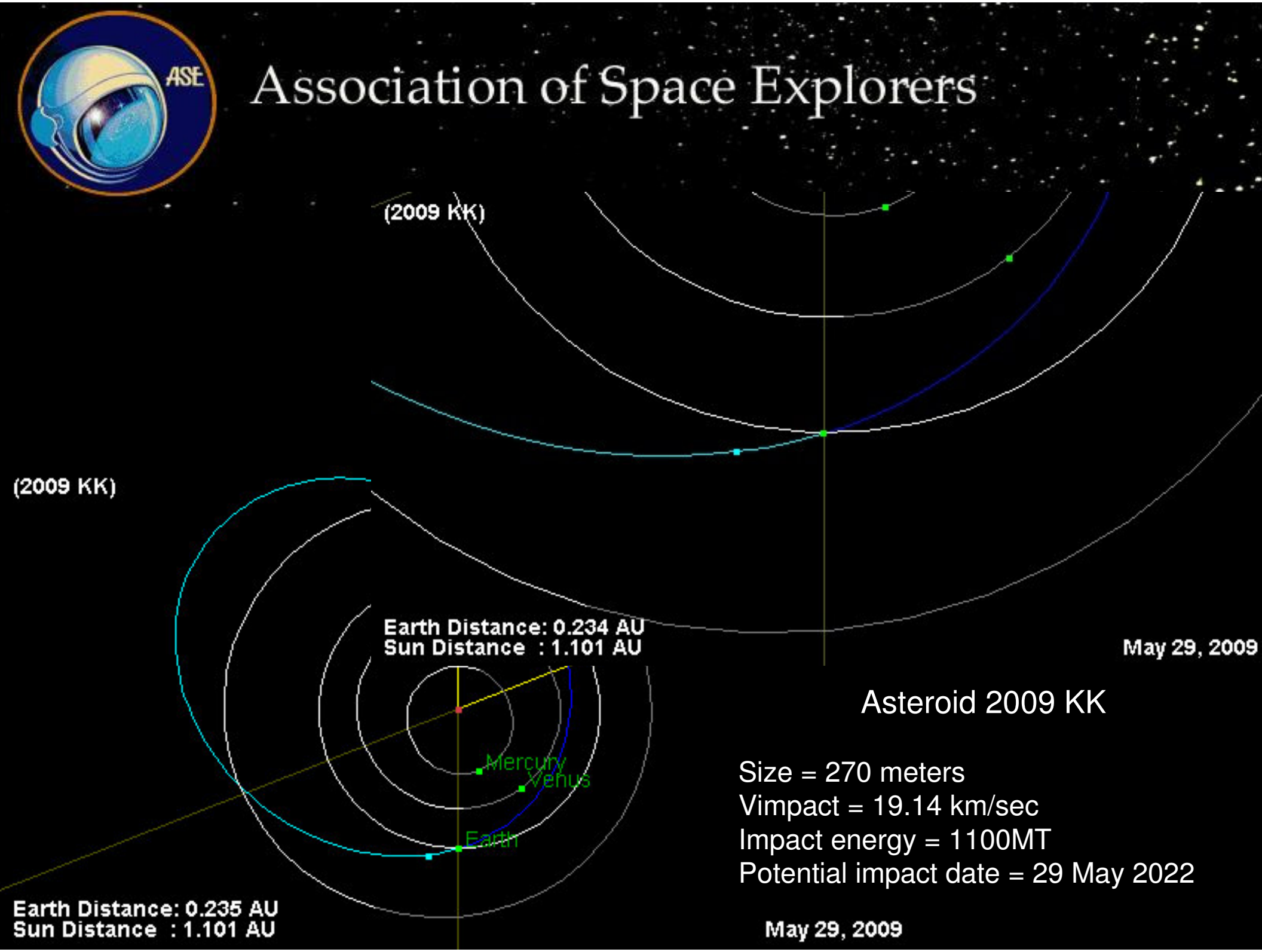


Risk Corridor; Apophis – 2036
Probability ~ 1:45,000



Asteroid 2009 KK

Size = 270 meters
Vimpact = 19.14 km/sec
Impact energy = 1100MT
Potential impact date = 29 May 2022

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Impact Probability

These results were computed on May 22, 2009

2009 KK

Earth Impact Table

1 in 34,000

These results were computed on May 23, 2009

2009 KK

Earth Impact Table

1,000

These results were computed on Jun 03, 2009

2009 KK

Earth Impact Table

Date	Distance	Width	Sigma Impact	Sigma LOV	Stretch LOV	Impact Probability	Impact Energy	Palermo Scale	Torino Scale
YYYY-MM-DD.DD	(r_{Earth})	(r_{Earth})			(r_{Earth})		(MT)		
2022-05-29.76	0.59	1.67e-02	0.000	-1.07384	3.75e+03	9.6e-05	1.11e+03	-1.17	1

2,000

Today IP = 1 in 10,000

These results were computed on May 27, 2009

2009 KK

Earth Impact Table

1 in 27,000

Date	Distance	Width	Sigma Impact	Sigma LOV	Stretch LOV	Impact Probability	Impact Energy	Palermo Scale	Torino Scale
YYYY-MM-DD.DD	(r_{Earth})	(r_{Earth})			(r_{Earth})		(MT)		
2022-05-29.76	0.55	3.95e-02	0.000	-1.37550	7.21e+03	3.6e-05	1.11e+03	-1.60	1

1 in 28,000

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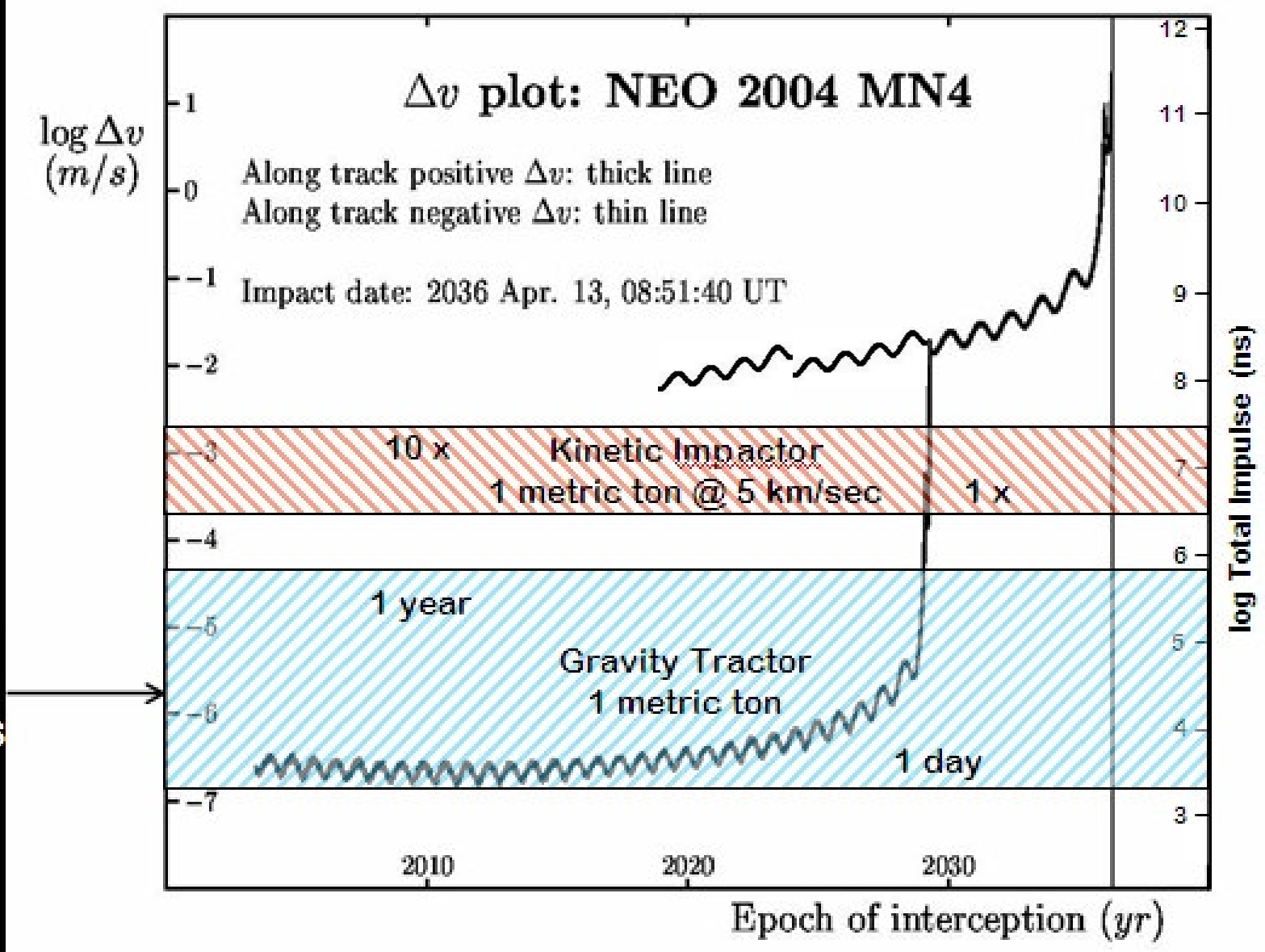

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It is too early to speculate on the outcome of this process. The recommendations, taken at face value, are precedent setting, calling for the establishment of a standing international decision-making process designed to yield timely decisions in the face of a global threat for which action must be taken a decade or more in advance of a potential disaster. Moreover a decision to act to prevent a disaster will necessarily involve the temporary shifting of risk between nations in the process of eliminating the risk to all. Whether or not the international community, within or outside the United Nations, can rise to the demands of such a challenge in advance of an impact …, is problematic. Nevertheless through the considered work of the ASE and its international Panel on Asteroid Threat Mitigation (and AT-14) the issues and related recommendations to protect the Earth from NEO impacts are now placed squarely on the member states of the United Nations Committee for the Peaceful Uses of Outer Space.

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Q&A

ASE report available online @
http://www.space-explorers.org/ATACGR.pdf