

**International Symposium on Near-Earth Hazardous Asteroids
Malta 12-16 October 2009**

10-11 October Participants arrival

12 October 9.00 – 10.00 Participants registration in the Russian Center
of Science and Culture

10.00 – 10.30 Symposium opening

Speakers:

Andrey Granovsky, Russian Federation Ambassador on Malta,
Sergey Medvedev, Director of Russian Center of Science and Culture on Malta
Lev Zelenyi, Director of Space Research Institute (IKI) of Russian Academy of Sciences,
Boris Shustov, Director of Institute of Astronomy of Russian Academy of Sciences,
Nicolas Bobrinsky, Head of Department of ESOC,
Victor Lavrov, Head Designer of Informational Satellite Systems Co.

10.30 – 13.30 Plenary session 1

Chairman Lev Zelenyi (Space Research Institute (IKI), Russia)

1. On the coordinated response to the complex ACH problem.
Boris Shustov
Institute of Astronomy of the Russian Academy of Sciences, Moscow, Russia

2. The new European Space Situational Awareness Programme
N. Bobrinsky ⁽¹⁾, G. Drolshagen ⁽²⁾, D. Koschny ⁽²⁾

⁽¹⁾ESA/ESOC, Darmstadt, Germany
⁽²⁾ESA/ESTEC, Noordwijk, The Netherlands

3. Using Venus for locating space observatories to discover Potentially Hazardous Asteroids
David W. Dunham ⁽¹⁾, Anthony L. Genova ⁽²⁾
⁽¹⁾KinetX, Inc.
7913 Kara Ct
Greenbelt, MD 20770-3016, USA
Email: David.Dunham@kinetx.com
⁽²⁾NASA Ames Research Center
Mission Design Center, Bldg. 202
Moffett Field, CA 94035, USA
Email: Anthony.Genova@nasa.gov

13.30- 14.00 Coffee break

14.00 – 17.00 Plenary session 2

Chairman Nicolas Bobrinsky (ESA/ESOC)

1. ISON capability to monitor the Near – Earth asteroids

I. Molotov^(1,2), V. Agapov⁽¹⁾, Y. Krugly⁽³⁾, Y. Ivashchenko⁽⁴⁾, L. Elenin⁽¹⁾

⁽¹⁾*Keldysh Institute of Applied Mathematics RAS, Russia,*

⁽²⁾*Central Astronomical Observatory at Pulkovo RAS, Russia,*

⁽³⁾*Institute of Astronomy, Karazin Kharkiv National University, Kharkiv, Ukraine,*

⁽⁴⁾*Andrushivka Observatory, Ukraine*

2. The Near-Earth Objects Segment of the European Space Situational Awareness Programme

G. Drolshagen⁽¹⁾, D. Koschny⁽¹⁾, N. Bobrinsky⁽²⁾

⁽¹⁾*ESA/ESTEC, Noordwijk, The Netherlands*

⁽²⁾*ESA/ESOC, Darmstadt, Germany*

3. Phobos Sample Return mission

L. Zelenyi,

Space Research Institute (IKI), Moscow, Russia, zelenyi@iki.rssi.ru

19.00 – 21.00 Cocktail party for Symposium participants and guests

13 October 9.00 – 13.00

Section on detection of hazardous sky objects and methods of their ephemeris determination.

9.00 – 13.00 Session 1.

Chairman Boris Shustov (Institute of Astronomy RAS)

1. Instruments and methods of Hazardous Asteroids Detection with use of the groundbased and space optical devices

V.G.Kurt

*Astrospace Centre of Lebedev Physical Institute of the Russian Academy of Sciences
(e-mail: vkurt@asc.rssi.ru)*

2. Current status of amateur observations of small bodies in the CIS countries

L. Elenin⁽¹⁾, V. Ivashchenko⁽²⁾, T. Kryachko⁽³⁾, B. Satovsky⁽³⁾, I. Molotov⁽¹⁾

⁽¹⁾*Keldysh Institute of Applied Mathematics RAS, Russia,*

⁽²⁾*Andrushivka Observatory, Ukraine,*

⁽³⁾*Astrotel, non-profit organization, Russia*

3. ESA R&D activity on SSA-NEO Preliminary Definition

R.Franco

ESA/ESTEC, Noordwijk, The Netherlands

10.30 – 10.50 Coffee break

4. Accuracy of estimations of Apophis motion parameters

B.Ts.Bakhshiyev, K.S.Fedyayev, A.A. Sukhanov

Space Research Institute (IKI) of the Russian Academy of Sciences, Moscow, Russia,
bbakhshiyev@gmail.com, kfediyev@yandex.ru

5. The relevance of asteroid occultation measurements to asteroid position measurements.

D.Koschny, G. Drolshagen

ESA/ESTEC, Keplerlaan 1, 2201 AZ Noordwijk ZH

6. Concerning quasi-Periodicity of close Encounters of two space bodies on close near circular orbits

V.I. Prokhorenko

Space Research Institute (IKI) of the Russian Academy of Sciences, Moscow, Russia

13.30 – 14.30 Lunch

Section on detection of hazardous celestial objects and methods of their ephemeris determination

14.30 – 17.10 Session 2.

Chairman David Dunham (KinetX,USA)

1. Estimation of close encounter accuracy by bootstrap method

Josselin Desmars

Institut de Mecanique Celeste et de Calcul des Ephemerides – Paris Observatory,
77 avenue Denfert-Rochereau, F-75014 Paris, France

2. Long term impact monitoring: difficult but necessary

G. B. Valsecchi (*IASF-Roma, INAF, Italy*), A. Milani (*University of Pisa, Italy*), S. R. Chesley (*Jet Propulsion Laboratory, USA*), M. E. Sansaturio (*University of Valladolid, Spain*), F. Bernardi, (*IASF-Roma, INAF, Italy, and University of Pisa, Italy*), O. Arratia (*University of Valladolid, Spain*)

3. The simulation of the asteroid (99942) Apophis motion before and after the close encounter in year 2029.

L.E. Bykova , T.Yu Galushina
Tomsk State University, Tomsk, Russia

16.00-16.10 Coffee break

4. Storing and processing of astrometric and photometric data about near Earth asteroids: present and future in Russia

S.Naroenkov
Institute of Astronomy of the Russian Academy of Sciences, Moscow, Russia

5. Estimation of possibility to use satellite system for detection and orbital parameters determination of hazardous near Earth objects

V. Lavrov
Informational Satellite Systems Co.,Ltd., Zheleznogorsk, Russia

14 October 10.00 – 14.10

10.00 – 14.10 Section 2.

Spacecraft missions as a method of discovering and exploration of hazardous asteroids and comets and prevention their collision with the Earth.

Chairman Vladimir Kurt (Astrospace Center, RAS, Russia)

1. A mission template for exploration and mitigation of potentially Hazardous Near Earth Asteroids

D.C. Hyland⁽¹⁾, H. A. Altwaijry⁽²⁾, R. Margulieux⁽³⁾, J. Doyle⁽³⁾,
J. Sandberg⁽³⁾, B. Young⁽³⁾, N. Satak⁽³⁾, J. Lopez⁽³⁾, S. Ge⁽³⁾, X. Bai⁽³⁾

⁽¹⁾ *Professor of Aerospace Engineering, College of Engineering, Professor of Physics, College of Science, Texas A&M University*

⁽²⁾ *Deputy Director, National Satellite Technology Program, King Abdulaziz City for Science and Technology, Saudi Arabia*

⁽³⁾ *Graduate student, Texas A&M University*

2. ESA Planetary Database (PDB)

A.Bavandi⁽¹⁾, Antoine.Bavandi@esa.int, G.Ortega⁽¹⁾, Guillermo.Ortega@esa.int
A.Wiegand⁽²⁾, andreas.wiegand@astos.de, S.Weikert⁽²⁾, sven.weikert@astos.de

⁽¹⁾ *ESA/ESTEC*

⁽²⁾ *Astos Sol.*

3. Mission Aster: Flight to a Binary or Triple Near-Earth Asteroid

A.A. Sukhanov, Sasha.su@hotmail.com
Space Research Institute (IKI) of the Russian Academy of Sciences

4. Spacecraft for asteroid exploration missions.

Ilya Lomakin

Lavochkin NPO, Russia, Moscow

5. Analysis of the existing and future observations of asteroid Apophis

A.A. Sukhanov, Sasha.su@hotmail.com, B.Ts.Bakhshiyev, K.S.Fedyaev

Space Research Institute (IKI) of the Russian Academy of Sciences

12.00 – 12.10 Coffee break

6. Permanently-Acting NEA mitigation technique via the Yarkovsky Effect

D.C. Hyland⁽¹⁾, H. A. Altwaijry⁽²⁾, S. Ge⁽³⁾, R. Margulieux⁽³⁾, J. Doyle⁽³⁾,
J. Sandberg⁽³⁾, B. Young⁽³⁾, X. Bai⁽³⁾, J. Lopez⁽³⁾, N. Satak⁽³⁾

⁽¹⁾ *Professor of Aerospace Engineering, College of Engineering, Professor of Physics,
College of Science, Texas A&M University*

⁽²⁾ *Deputy Director, National Satellite Technology Program, King Abdulaziz City for
Science and Technology, Saudi Arabia*

⁽³⁾ *Graduate student, Texas A&M University*

7. Method of Controlling Asteroid Collision with Earth

E.Gonzaga, Ernestogonz2003@yahoo.com

George Washington University, USA

8. Using of gravity assist maneuvers for targeting small asteroids to Hazardous
Near-Earth Objects

R.Nazirov, N.Eismont

Space Research Institute (IKI) of the Russian Academy of Sciences, Moscow, Russia

14.10 – 15.00 Lunch

15.00 – 17.00 Free discussion of the hazardous asteroids problem – round table.

19.30 – 21.30 Dinner for Symposium participants and guests

15 October

10.00- 13.00 Presentation of the exhibition of scientific projects of the Space Research
Institute (IKI) RAS, Keldysh Institute of Applied Mathematics RAS,
and Institute of Astronomy RAS,

Press conference

14.00 - 17.00 City tour

16 October

10.00 - 12.00

Press conference on results of Symposium and Exhibition of scientific projects of the institutes of the Russian Academy of Sciences

Participants departure