

1st IAA Planetary Defense Conference

PROGRAMME

Pre-Registration - Sunday, 26 April 2009

16:00-18:00	Pre-registration
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Day 1 - Monday, 27 April 2009

08:00-09:00	Registration
09:00-09:10	Welcoming Remarks <i>W. Ailor, R. Tremayne-Smith</i>
09:10-09:25	Welcoming Remarks <i>Rafael Rodrigo - President of the National Scientific Research Council (CSIC)</i>
09:25-09:40	The IAA at 50 <i>J.M. Contant</i>
09:40-10:10	Keynote Astronaut Pedro Duque
Session 1	Discovery, Tracking, Characterization Session Chairs: Don Yeomans, Lindley Johnson, Dave Lynch
10:10	Poster Papers
10:10-10:30	Abstract NASA's Near-Earth Object Program <i>Johnson, L.N. (NASA HQ, United States); Yeomans, D.K. (Jet Propulsion Laboratory, United States)</i>
10:30-10:50	Abstract Long Term Impact Monitoring: Difficult but Necessary <i>Valsecchi, G.B.¹; Milani, A.²; Chesley S.R.³; Sansaturio, M.E.⁴; Bernardi, F.²; Arratia, O.⁴; ¹(IASF-Roma, Italy); ²(University of Pisa, Italy); ³(Jet Propulsion Laboratory, United States); ⁴(University of Valladolid, Spain)</i>
10:50-11:10	Abstract Albedo and Size Determination of PHAs and the Case of (99942) Apophis <i>Delbo, M. (UNS-OCA-CNRS, France); Alberto, C. (INAF-Osservatorio Astronomico di Torino, Italy)</i>
11:10-11:40	Break
11:40-11:50	Announcement of poster papers
11:50-12:10	Abstract Asteroid Potential Impact Warnings <i>Chesley, S.R. (Jet Propulsion Laboratory, United States)</i>
12:10-12:30	Abstract Impact Warning Times for the Next Generation of Asteroid Surveys <i>Chodas, P.W.; (Jet Propulsion Laboratory, United States)</i>
12:30-12:50	Abstract Predicting the Apophis Earth Encounters in 2029 and 2036 <i>Giorgini, J.¹; Benner, L.A.M.¹; Ostro, S.J.¹; Nolan, M.C.²; Busch, M.W.³ ¹Jet Propulsion Laboratory/California Institute of Technology (United States); ²Arecibo Observatory (United States); ³California Institute of Technology (United States)</i>
12:50-13:10	Panel Discussion
13:10-14:30	Lunch
14:30-14:40	Announcement of poster papers
14:40	Abstract Minor Planet Center Activities in the Next Generation of Search <i>Tim Spahr, (Smithsonian Astrophysical Observatory, United States)</i>
15:00	Abstract The Pan-STARRS Survey for Near Earth Objects <i>Granvik, M.; Wainscoat, R.; Jedicke, R.; Denneau, L. University of Hawaii (United States)</i>

15:20	Abstract Detecting NEOs using LSST <i>Zeljko Ivezić (University of Washington, United States)</i>
15:40	Abstract AsteroidFinder/SSB: A German Mission for the Search of IEOs <i>Mottola, S.¹; Behrens, J.¹; Börner, A.¹; Gerene, S.²; Grundmann, J.T.¹; Hahn, G.¹; Hallmann, M.¹; Kührt, E.¹; Michaelis, H.¹; Scheibe, K.¹; Schmitz, N.¹; Spietz, P.¹; ¹DLR (Germany); ²JAQAR (Netherlands)</i>
16:00	Break
16:30	Announcement of poster papers
16:40	Abstract IR Techniques to Detect and Characterize NEOs <i>Mainzer, A.¹; Wright, E.²; McMillan, R.³; Eisenhardt, P.¹; Trilling, D.⁴; Walker, R.⁵; ¹Jet Propulsion Laboratory (United States); ²UCLA (United States); ³University of Arizona (United States); ⁴Northern Arizona University (United States); ⁵MIRA (United States)</i>
17:00	Abstract Remote Characterization of NEOs <i>Rick Binzel (MIT, United States / Paris Observatory, France)</i>
17:20	Abstract Radar Reconnaissance of Near-Earth Asteroids <i>Benner, L.; Ostro, S.J. (Jet Propulsion Laboratory, United States)</i>
17:40	Abstract Physical Characterization of Sub-Km NEAs: Low cost Mission Approaches <i>Morrison, D.¹; Chartres, J.¹; Coloprete, A.¹; Genova, A.¹; Jaroux, B.¹; Johnson, R.¹; Lemke, L.¹; Williams, B.²; Chesley, S.³ ¹NASA Ames Research Center (United States); ²KinetX (United States); ³Jet Propulsion Lab (United States)+</i>
18:00-18:45	Panel Discussion
19:00	Welcome reception at Hotel San Anton

Day 2 - Tuesday, 28 April 2009

09:00-09:10	Intro & Welcome <i>R. Tremayne-Smith</i>
Session 2	Mission and Campaign Design Session Chairs: Mariella Graziano, Ian Carnelli, Andreas Rathke
09:10-09:30	Announcement of poster papers
09:30-09:50	Abstract Didymos Explorer and PANIC: Asteroid Concept Studies of the S4P Program at NASA Ames <i>Rozitis, B.¹; Bellerose, J.²; Cook, A.³; Fahnestock, E.⁴; Mester, C.⁵; Murdoch, N.⁶; Olds, P.⁷; Reddy, V.⁸; Schindler, K.⁹; Thomas, C.¹⁰; Yamaguchi, T.¹¹; Asphaug, E.¹²; Marchis, F.¹³ ¹The Open University (United Kingdom); ²JAXA/JSPEC (Japan); ³Rensselaer Polytechnic Institute (United States); ⁴University of Michigan (United States); ⁵Stanford University (United States); ⁶ESTEC/ESA (Netherlands); ⁷UARC/NASA Ames (United States); ⁸University of North Dakota (United States); ⁹University of Dresden (Germany); ¹⁰Massachusetts Institute of Technology (United States); ¹¹The Graduate University for Advanced Studies (Japan); ¹²University of California (United States); ¹³SETI (United States)</i>
09:50-10:10	Abstract Navigation and Guidance of Hayabusa around the Tiny Asteroid Itokawa <i>Yoshikawa, M.¹; Kawaguchi, J.¹; Hashimoto, T.¹; Kubota, T.¹; Terui, F.¹; Ogawa, N.¹; Ikeda, H.¹; Kominato, T.²; Matsuoka, M.²; Uo, M.³ ¹JAXA (Japan); ²NEC Aerospace System (Japan); ³NEC Toshiba Space System (Japan)</i>
10:10-10:30	Abstract The Challenge of Navigating Toward and Around a Small, Irregular NEO <i>Gil-Fernandez, J.; Prieto-Llanos, T.; Cadenas, R.; Corral, C.; Graziano, M. (GMV, Spain)</i>
10:30-10:50	Abstract Foresight: Designing a Radio Transponder Mission to Near Earth Asteroid Apophis <i>Charania, A.¹; Olds, J.¹; Koenig, J.² ¹SpaceWorks Engineering, Inc. (SEI) (United States); ²SpaceDev, Inc. (United States)</i>

10:50-11:10	Abstract PROBA-IP: An ESA Technology Demonstration Mission Targeted to Apophis <i>Cano, J.L.¹; Peñín, L.F.¹; Cornara, S.¹; Santandrea, S.²; Marcos, F.³; López, A.³; Jentsch, C.⁴; Bernhardsdotter, E.⁵; Taylor, M.⁶; Page, O.⁷; ¹DEIMOS Space S.L. (Spain); ²ESA / ESTEC (Netherlands); ³EADS CASA Espacio (Spain); ⁴EADS Astrium Satellites (Germany); ⁵SSC (Sweden); ⁶SSTL (United Kingdom); ⁷SciSys (United Kingdom)</i>
11:10-11:40	Break
11:40-12:00	Abstract Exploration of Near-Earth Objects via the Orion Crew Exploration Vehicle: A Planetary Defence Rationale <i>Abell, P.A.¹; Korsmeyer, D.J.²; Landis, R.R.³; Jones, T.D.⁴; Adamo, D.⁵; Morrison, D.⁶; Lemke, L.⁶; Gonzales, A.⁶; Gershman, B.⁷; Sweetser, T.⁷; Johnson, L.⁸</i> ¹ NASA Johnson Space Center / Planetary Science Institute (United States); ² Intelligent Systems Division, NASA Ames Research Center (United States); ³ Mission Operations Directorate, NASA Johnson Space Center (United States); ⁴ Association of Space Explorers (United States); ⁵ Trajectory Consultant (United States); ⁶ NASA Ames Research Center (United States); ⁷ Jet Propulsion Laboratory (United States); ⁸ NASA Headquarters (United States)
12:00-12:20	Abstract A Dawn-based Gravity Tractor and Kinetic Impactor Mission Concept Study <i>Wie, B. (Iowa State University, United States); Lam, Q. (Orbital Sciences Corporation, United States)</i>
12:20-13:00	Panel Session
13:00-14:30	Lunch
Session 3	Deflection Technologies & Simulations Session Chairs: Dario Izzo, Patrick Michel
14:30-14:50	Poster Papers
14:50-15:10	Abstract Methods for the Deflection of Threatening Asteroids: Some Problems, Theoretical Considerations and a Few Myths <i>Keith Holsapple (University of Washington, U.S.)</i>
15:10-15:30	Abstract Asteroid Deflection by Means of Electromagnetic Forces During an Earth Fly-by <i>Sanjurjo-Rivo, M.; Peláez, J. (Universidad Politécnica de Madrid, Spain)</i>
15:30-15:50	Abstract Simulations of the Deflection of an Apophis-like Object <i>Jutzi, M.¹; Michel, P.²; Benz, W.¹</i> ¹ University of Bern (Switzerland); ² University of Nice-Sophia Antipolis, Côte d'Azur Observatory (France)
15:50-16:10	Abstract Dynamical Characterization, Control, and Performance Analysis of Gravity Tractor Operation at Binary Asteroids <i>Eugene Fahnestock (University of Michigan / NASA Jet Propulsion Laboratory, United States)</i>
16:10-16:30	Abstract The SHADOW Mission: Deflecting APOPHIS with a Flotilla of Solar Shields <i>Prado, J.-Y.¹; Perret, A.²; Boisard, O.²; Bertrand, R.¹</i> ¹ CNES (France); ² U3P (France)
16:30-16:50	Abstract Asteroid Deflection Theory: Deflection Charts and some New Deflection Options <i>Izzo, D.; Chy, C.H.Y. (European Space Agency, Netherlands)</i>
16:50-17:20	Break
17:20-17:30	Ariadna Encounter 2029: Introduction to the three studies
17:30-17:45	Abstract Catastrophic Impact Energy Threshold for Disruption of Small Porous and Non-Porous Asteroids: a Crucial Information for Deflection Strategies <i>Michel, P.¹; Jutzi, M.²; Benz, W.²; Richardson, D.C.³</i> ¹ University of Nice-Sophia Antipolis, Côte d'Azur Observatory (France); ² University of Bern (Switzerland); ³ University of Maryland (United States)

17:45-18:00	Abstract Designs of Multi-Spacecraft Swarms for the Deflection of Apophis by Solar Sublimation <i>Vasile, M.¹; Maddock, C.¹; McInnes, C.²; Radice, G.¹; Summerer, L.³</i> ¹ University of Glasgow (United Kingdom); ² Strathclyde University (United Kingdom); ³ ESA Advanced Concepts Team (Netherlands)
18:00-18:15	Abstract Apophis Encounter 2029: Differential Algebra and Taylor Model Approaches <i>Armellin, R.; Di Lizia, P.; Bernelli-Zazzera, F. (Politecnico di Milano, Italy)</i>
18:15-18:35	Abstract New Directions in Asteroid Deflection using Nuclear Explosives <i>Dearborn, D.¹; Schultz, P.²; Ulrich, W.³</i> ¹ LLNL (United States); ² Brown University (United States); ³ DTRA (United States)
18:35-18:55	Abstract Using a Gravity Tractor to Help Mitigate Asteroid Collisions with Earth <i>Yeomans, D.K.¹; Bhaskaran, S.¹; Broschart, S.R.¹; Chesley, S.R.¹; Chodas, P.W.¹; Jones, M.A.¹; Sweetser, T.H.¹; Lu, E.T.²; Schweickart, R.L.²</i> ¹ JPL/Caltech (United States); ² B612 Foundation (United States)
18:55-19:30	Panel Discussion
19:30	Cocktail drink at the poster area of Palacio de Exposiciones y Congresos de Granada

Day 3 - Wednesday, 29 April 2009

09:00-09:10	Intro & Welcome <i>W. Ailor</i>
09:10-09:40	Keynote Impacts, Catastrophism and Technological Capability to Other Areas of Endeavour <i>Oliver Morton (Chief News and Features Editor, Nature, London, UK)</i>
Session 4	Neo Impacts & Consequences Session Chairs: David Morrison, Al Harris
09:40-10:00	Announcement of poster papers
10:00-10:20	Abstract The Nature of Airbursts and their Contribution to the Impact Threat <i>Mark Boslough (Sandia National Laboratory, United States)</i>
10:20-10:40	Abstract Every Threatening Asteroid an Apophis <i>Lu, E.T. (B612 Foundation, United States)</i>
10:40-11:00	Abstract The Carancas Event: a Recent Hypervelocity Impact Crater in the Altiplano <i>Tancredi, G.¹; Ishitsuka, J.²; Schultz, P.³; Harris, S.³; Brown, P.⁴; ReVelle, D.⁵</i> ¹ Fac. Ciencias (Montevideo); ² Instituto Geofísico del Peru (Montevideo); ³ Dept. Geological Sciences, Brown University (United States); ⁴ Dept. of Physics and Astronomy, University of Western Ontario (Canada); ⁵ Meteorological Modeling Team, Los Alamos National Laboratory (United States)
11:00-11:30	Break
11:30-11:50	Abstract Near-Field Effects of Asteroid Impacts in Deep Water <i>Gisler, G.¹; Weaver, R.²</i> ¹ University of Oslo (Norway); ² Los Alamos National Laboratory (United States)
11:50-12:10	Abstract Insurance and Meteors Fall: Proposal of a Methodology for Estimating the Risk and Modeling Consequences for the Insurance Sector in France <i>Garbolino, E.¹; Michel, P.²; Holsapple, K.³</i> ¹ Ecole des Mines de Paris (France); ² National Center for Scientific Research (France); ³ University of Washington (United States)
12:10-12:30	Abstract Estimating the NEO Population and Impact Risk: Past, Present and Future <i>Al Harris; Space Science Institute (United States)</i>

12:30-12:50	Abstract Casualty and Fatality Rates of Massive Extinction After Asteroid Impact with Earth <i>Ortega, G.¹; Bavandj, A.¹; Weikert, S.²; Giron Sierra, J.M.³; Laurel, C.⁴</i> ¹ ESA (Netherlands); ² ASTOS Solutions GmbH (Germany); ³ University of Madrid (Spain); ⁴ Periapsis Visual Software (United States)
12:50-13:30	Panel Session
13:30-15:00	Lunch
Session 5	Policy, Preparedness, Deciding to Act Session Chairs: Andres Galvez, A.C. Charania
15:00-15:10	Announcement of poster papers
15:10-15:30	Abstract Report on University of Nebraska-Lincoln Conference "Near-Earth Objects: Risks, Responses and Opportunities—Legal Aspects" <i>Frans von der Dunk (University of Nebraska-Lincoln, United States)</i>
15:30-15:50	Abstract NEO Mitigation and Coordination with the Disaster Management Community <i>Chapman, C.; Schweickart, R. (B612 Foundation, United States)</i>
15:50-16:10	Abstract Near-Earth Objects within the European Space Situational Awareness Programme <i>Koschny, D.¹; Bobrinsky, N.²; del Monte, L.³</i> ¹ ESA/ESTEC (Netherlands); ² ESA/ESOC (Germany); ³ ESA/HQ (France)
16:10-16:30	Abstract Results of Multi-Agency Deflection and Disaster Exercise <i>Garretson, P.¹; Johnson, L.²</i> ¹ Council on Foreign Relations (United States); ² NASA/HQ (United States)
16:30-17:00	Break
17:00-17:20	Abstract The Need to Match Action with Legislation: Some Inconsistencies in the OST <i>Azcarraga Arana, A.¹; Gonzalez Ferreiro, E.²</i> ¹ Sener Ingeniería Y Sistemas (Spain); ² Cede (Centro Español De Derecho Espacial) (Spain)
17:20-17:40	Abstract Public Health and Environmental Activities Concerning the NEOs <i>Mariagrazia Spada (University of Rome "La Sapienza," Italy)</i>
17:40-18:25	Panel Discussion
20:30	Conference Dinner at Carmen de los Chapiteles

Day 4 - Thursday, 30 April 2009

09:00-09:10	Intro & Welcome <i>R. Tremayne-Smith</i>
Session 6	What's Happening Now Session Chairs: Richard Tremayne-Smith, Ray Williamson
09:10-09:30	Abstract Asteroid Threats: A Call for Global Response: The ASE's Challenge to the International Community <i>Schweickart, R. ; Jones, T.D. ; Prunariu, D.D. (Association of Space Explorers, United States)</i>
09:30-09:50	Abstract NEO Report by the IAA <i>Ivan Bekey (United States)</i>
09:50-10:10	Abstract US –NAS/NRC Study Progress <i>Michael A'Hearn (United States)</i>
10:10-10:30	Abstract NEOimpactor - A Tool for Assessing Earth's Vulnerability to the NEO Impact Hazard <i>Bailey, N.J.¹; Swinerd, G.G.²; Lewis, H.G.²; Crowther, R.³</i> ¹ School of Engineering Sciences (United Kingdom); ² School of Engineering, University Southampton (United Kingdom); ³ Rutherford Appleton Laboratory (United Kingdom)

10:30-10:50	Abstract The NEO Primer: A Tool For Collaboration, Communication, and Outreach <i>Weeden, B.; Williamson, R. (Secure World Foundation, United States)</i>
10:50-11:10	Panel Session
11:10-11:30	Break
Session 7	Panel Session & Discussion - Findings & Recommendations
11:30-13:00	Discussion <i>W. Ailor, Moderator</i>
13:00	Closing