



The Fourth **COSPAR Symposium**

Small Satellites for Sustainable Science and Development

November 4 - 8, 2019 | Daniel Hotel, Herzliya, Israel



PROGRAM

MONDAY, NOVEMBER 4, 2019

09:00-10:30 Roundtable discussion of Space Agency Leaders

Hall A

Confirmed Participants

- ◆ **Lennard A. Fisk** - President, COSPAR - Moderator
- ◆ **Isaac Ben-Israel** - Chairman, Israel Space Agency (ISA)
- ◆ **George A. Danos** - President, Cyprus Space Exploration Organization (CSEO)
- ◆ **Stamatios Krimigis** - Hellenic Space Agency, Counselor to the Minister for Digital Governance, Chairman, Athens COSPAR 2022 Assembly Scientific Program Committee
- ◆ **Hitoshi Kuninaka** - Director General, Japan Aerospace Exploration Agency Institute of Space and Astronautical Science (JAXA/ISAS)
- ◆ **Jean-Yves Le Gall** - President, Centre National d'Etudes Spatiales (CNES)
- ◆ **Anatoli Petrukovich** - Director of the Russian Institute of Space Research (IKI)
- ◆ **Pierluigi Silvestrin** - The European Space Agency
- ◆ **Solomon Belay Tessema** - Ethiopian Space Science and Technology Institute (ESSTI)
- ◆ **Thomas H. Zurbuchen** - Associate Administrator, National Aeronautics and Space Administration (NASA)
Representatives of ESA, DLR, ASI and other agencies

10:30-11:00 Coffee Break and Poster Sessions for A.1, B.1, PCB.1

11:00-12:30 Session D.1

Hall A

Chairs: MSO: **Jaejin Lee**, DO: **Kyung-Joo Hwang**

11:00

CuSP: The CubeSat Mission for studying Solar Particles

Mihir Desai

Space Research, Southwest Research Institute, San Antonio, Texas, USA

11:20

REAL: A CubeSat to Study Energetic Electron Precipitation into Earth's Atmosphere

Robyn Millan¹, Thomas Sotirelis², John Sample³, Leslie Woodger¹,
Wen Li⁴, Romina Nikoukar², Sasha Ukhorskiy², Arlo Johnson³,
Mykhailo Shumko³, Luisa Capannolo⁴

¹*Physics and Astronomy, Dartmouth College, Hanover, NH, USA*

²*Applied Physics Laboratory, Johns Hopkins University, Laurel, MD, USA*

³*Physics, Montana State University, Bozeman, MT, USA*

⁴*Astronomy, Boston University, Boston, MA, USA*

- 11:40 **GTOSat: A Next-Generation CubeSat to study Earth's Radiation Belts**
Lauren Blum¹, Larry Kepko¹, Drew Turner², Allison Jaynes³, Shri Kanekal¹,
 Quintin Schiller¹
¹Goddard Space Flight Center, NASA, Greenbelt, MD, USA
²Space Sciences Department, Aerospace Corporation, Los Angeles, CA,
 USA
³Physics and Astronomy, University of Iowa, Iowa City, Iowa, USA
- 12:00 **Research Progress of Small Radiation Dose Monitoring Instrument**
Qi Lu, Qinglong Yu, Yueqiang Sun, Xianguo Zhang
 Laboratory Of Space Environment Exploration, National Space Science
 Center, CAS, Beijing, Beijing, China
- 12:15 **A View of a Small Solar Satellite**
Alan Title,
 Lockheed Martin Advance Technology Center, USA

11:00-12:30 Session B.1 **Hall B**
 Chairs: MSO: **Maria Cristina Falvella**, DO: **Pietro Ubertini**

- 11:00 **Planetology with Small Satellites: Results and Perspectives**
Enrico Flamini², Giuseppe Mitri, Giuseppe Mitri¹
¹IRSPS, Univeristà D'Annunzio Chieti-Pescara, Pescara, Italy
²DTS, Agenzia Spaziale Italiana, Roma, Italy
- 11:20 **The PROBA-3 Mission**
Andrei Zhukov
 Solar-Terrestrial Centre of Excellence - SIDC, Royal Observatory of Belgium,
 Belgium
- 11:40 **Project of the Spacecraft "Gravisat"**
Serhii Matviienko
 NSA of Ukraine, PJSC "RPC" KURS", Kiev, Ukraine
 NSA of Ukraine, Private Joint-Stock Company "Scientific-Production
 Enterprise" KURS ", Kiev, Ukraine
 National Space Agency of Ukraine, Private Joint-Stock Company "Scientific-
 Production Enterprise" KURS, Kiev, Ukraine
- 11:55 **Status of Planetary Missions and the Proposal for a Possible Future
 Targets for the Turkish Space Agency**
Nesibe Ozel¹, Mehmet Emin Ozel²
¹Astronomy and Space Science, Erciyes University, Kayseri, Melikgazi, Turkey
²Science Department, Afşinbey Eğitim Kurumları, Kocaeli, Gebze, Turkey

12:10 **An overview of the Israeli Lunar Lander**
Ehud Hayun¹, Lutz Richter², Ephie Sagie¹, Natalie Frenkel¹, Andrea Jaime³,
Roland Graue², Meir Nissim-Nir¹, Timo Shtuffler⁴
¹*MBT Space Division, Israel Aerospace Industries Ltd., Yehud, Israel*
²*Future Programmes Science & Exploration, OHB System AG, Munich, Germany*
³*Business Development, OHB System AG, Munich, Germany*
⁴*Director of Business Development, OHB System AG, Munich, Germany*

11:00-12:30 Session PCB.1 **Hall C**
Chairs: MSO: **Loren Chang**, DO: **Amal Chandran**

11:00 **COSPAR Capacity Building and Small Satellites**
Carlos Gabriel, Peter Willmore
Capacity Building, COSPAR, Spain

11:20 **Lessons Learned in Advancing Academic Space Science Programs**
Michael McGrath
LASP, University of Colorado, Boulder, Colorado, USA

11:40 **The role of Givatayim Observatory in promoting science education**
Diana Laufer, Shalom Hanania
Givatayim Observatory, Kehilatayim, Givatayim, Israel

11:55 **Lessons Learned After 20 Years of Running a University CubeSat Lab**
John Bellardo, Ryan Nugent
Aerospace Engineering, California Polytechnic State University, San Luis Obispo, California, USA

12:10 **The Architecture of the Lucky 7 CubeSat**
Pavel Kovar
Department of Radio Engineering, Czech Technical University in Prague, Prague, Czech Republic

11:00-12:35 Session A.1 **Hall D**
Chairs: MSO: **Pierric Ferrier**, DO: **Philippe Crebassol**

11:00 **CSIROSat-1 mission - CDR and Early Subsystems Testing**
Adrian Rispler, Adrian Rispler, Nick Carter, Kimberley Clayfield
Astronomy and Space Science, CSIRO (Commonwealth Scientific and Industrial Research Organisation (Australia)), Sydney, New South Wales, Australia

- 11:20 **SERB, An Innovative Proof-Of-Concept Nanosatellite Mission Dedicated to The Measurement of The Earth Radiation Imbalance**
Mustapha Meftah, Philippe Keckhut, Alain Hauchecorne, Alain Sarkissian, Luc Damé
Space Physics, CNRS/LATMOS/UVSQ/Paris-Saclay/Sorbonne Université, Paris, France
- 11:35 **Taranis Mission**
Christophe Bastien-Thiry, Lydie Privat
DSO/SC/TAR, CNES, Toulouse, France
- 11:50 **Maritime Applications for Small Sats: Observations of ocean waves, currents, tides, and navigational hazards**
Ron Abileah, Stylianos Flampouris
Consulting, jOmegak, San Carlos, California, USA
- 12:05 **Microcarb Project: Atmospheric Co2 Monitoring with A Microsatellite**
Didier Pradines¹, Emilie Limasset¹, François Buisson¹, Pascal Prieur¹, Véronique Pascal², Denis Jouglet³, Carole Deniel⁴, François-Marie Bréon⁵
¹*Earth Observation, Centre National d'Etudes Spatiales (CNES), Toulouse, France*
²*Instrument System, Earth Observation, Centre National d'Etudes Spatiales (CNES), Toulouse, France*
³*Atmospheric Sounding, Earth Observation, Centre National d'Etudes Spatiales (CNES), Toulouse, France*
⁴*Innovation, Application and Science, Earth Observation, Centre National d'Etudes Spatiales (CNES), Paris, France*
⁵*Environment, Laboratoire des Sciences du Climat et de l'Environnement (LSCE), Gif sur Yvette, France*
- 12:20 **Stray light Solution for Ghgsat Nanosatellite**
 Vincent Latendresse¹, Dina Katsir², Keren Shabtai², Jason McKeever³, Victor Isbrucker⁴, Jonathan Lavoie¹, Roman V. Kruzelecky¹, Wes Jamroz¹
¹*R&D, MPB communications Inc, Quebec, Canada*
²*R&D, Acktar LTD, Kiryat Gat, Israel*
³*R&D, GHGSat Inc., Quebec, Canada*
⁴*R&D, Isbruker Consulting Inc., Ontario, Canada*

12:30-13:30 Lunch

Dining Room

- 13:30 **The Snipe Mission for Observing Small Scale Ionospheric and Magnetospheric Plasma Phenomena**
Jaejin Lee, Junga Hwang, Young-Sil Kwak, Jaeheung Park, Jong-dae Sohn
Space Science Division, Korea Astronomy and Space Science Institute, Daejeon, South Korea, South Korea
- 13:45 **Using the Miniature X-Ray Solar Spectrometer (Minxss) Cubesats To Probe Hot Plasma in The Atmosphere of A Cool Star**
*Christopher Moore*¹, Thomas Woods², Amir Caspi⁴, James Mason³
¹*High Energy, Harvard-Smithsonian Center for Astrophysics, Cambridge, Massachusetts, USA*
²*Solar Physics, Laboratory for Atmospheric and Space Physics, Boulder, Colorado, USA*
³*Solar Physics Laboratory, NASA Goddard Space Flight Center, Greenbelt, Maryland, USA*
⁴*Solar Physics, Southwest Research Institute, Boulder, Colorado, USA*
- 14:00 **Solar Bragg Spectrometry - New Opportunities with Micro- Satellites**
Jarosław Bąkała, Barbara Sylwester, Janusz Sylwester, Zanita Szaforz, Mirosław Kowaliński, Jaromir Barylak, Stefan Płocieniak
Solar Physics Division, Space Research Centre Polish Academy of Sciences, Wrocław, Poland
- 14:15 **A New Type of Neutral Atom Imaging and its Application in Space Weather Monitoring**
Qinglong Yu, Qi Lu, Li Lu, Yueqiang Sun, Xianguo Zhang
Laboratory Of Space Environment Exploration, National Space Science Center, CAS, Beijing, China
- 14:30 **The Atmospheric Effects of Precipitation through Energetic X-rays (AEPEX) CubeSat mission**
*Robert Marshall*¹, Wei Xu¹, Grant Berland¹, Andre Antunes de Sa¹, Elliott Davis¹, Christopher Cully², Thomas Woods³, Rick Kohnert³, Cora Randall³, Daniel Baker³, Harlan Spence⁴, Michael McCarthy⁵, Allison Jaynes⁶
¹*Aerospace Engineering Sciences, University of Colorado Boulder, Boulder, Colorado, USA*
²*Physics and Astronomy, University of Calgary, Calgary, Alberta, Canada*
³*Laboratory for Atmospheric and Space Physics, University of Colorado Boulder, Boulder, Colorado, USA*
⁴*Institute for the Study of Earth, Oceans, and Space, University of New Hampshire, Durham, New Hampshire, USA*
⁵*Earth and Space Sciences, University of Washington, Seattle, Washington, USA*
⁶*Physics and Astronomy, University of Iowa, Iowa City, Iowa, USA*

14:45 **Understanding the Ionosphere and Thermosphere**
Larry Paxton, Ethan Miller, Hyosub Kil, Yongliang Zhang,
Robert Schaefer
space exploraiton sector, *jhu/apl, laurel, Maryland, USA*

13:30-15:00 Session B.1 (2) Hall B
Chairs: MSO: **Maria Cristina Falvella**, DO: **Pietro Ubertini**

13:30 **Small Scale Radioisotope Thermoelectric Generators (RTGs) and Heater Units (RHUs): Enabling Technologies for Deep Space and Planetary Surface Missions**
Richard Ambrosi¹, Alessandra Barco¹, Ramy Mesalam¹,
Emily Jane Watkinson¹, Christopher Bicknell¹, Tony Crawford¹,
Hugo Williams², Marie-Claire Perkinson³, Colin Stroud⁴, Keith Stephenson⁵,
Kevin Simpson⁶, Richard Tuley⁶, Michael Reece⁷, Daniel Kramer⁸
¹*Department of Physics and Astronomy, University of Leicester, Leicester, UK*
²*Department of Engineering, University of Leicester, Leicester, UK*
³*Future Projects and Proposals, Exploration and Robotics,
Airbus Defense and Space Ltd, Stevenage, UK*
⁴*Missiles and Fire Control, Lockheed Martin UK, Ampthill, UK*
⁵*ESTEC TEC-EPM, European Space Agency, Noordwijk, Netherlands*
⁶*ETL, European Thermodynamics Ltd, Kibworth, UK*
⁷*Department of Materials, Queen Mary University of London, London, UK*
⁸*School of Engineering, Chemical and Materials,
University of Dayton Research Institute, Dayton, Ohio, USA*

13:45 **CNES perspectives for affordable missions to Deep Space**
Pierre Bousquet
Science projets, CNES, Toulouse, France

14:00 **A Reconfigurable Energetic Particle Detector for Planetary Exploration**
Pierre Devoto, Nicolas André
*IRAP, Université de Toulouse, CNRS, CNES, UPS, TOULOUSE,
Haute-Garonne, France*

14:15 **Performance and Supersonic Ion Beams of the ALPHIE (Alternative Low Power Hybrid Ion Engine) Plasma Thruster**
L. Conde¹, J. Gonzalez¹, J.M. Donoso¹, J. Damba¹, P.E. Maldonado¹,
M.D. Lahoz¹, M.A. Castillo²
¹*Applied Physics, E.T.S. Ingeniería Aeronáutica y del Espacio. Univ.
Politécnica de Madrid, Madrid, Madrid, Spain*
²*Engineering Department, Aernnova Aerospace SAU, Madrid,
Madrid, Spain*

- 14:30 **MarCo Spacecraft: Study and Analysis for Developing Communication Infrastructure for Manned Mission to Mars**
Ankita Vashishtha
Satellite Image Analysis and Photogrammetry, Indian Institute of Remote Sensing(MTech Student), Dehradun, Uttrakhand, India
- 14:45 **Dynamical Aspects of The Spatial Gravity Assists Using For The Forming High Inclined Orbits In The Planetary Missions**
Alexey Grushevskii, Yuri Golubev, Victor Koryanov, Andrey Tuchin, Denis Tuchin
Keldysh Institute of Applied Mathematics, Russian Academy of Sciences, Moscow, Russia
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- 13:30-15:00 Session PCB.1 (2) Hall C**
 Chairs: MSO: **Loren Chang**, DO: **Amal Chandran**
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- 13:30 **A Study of Students' Perceptions of The Role and Value of a Space Science Program for Sustainable Development**
Andoh Michael Afful¹, Margaret Hamilton², Alex Kootsookos³
¹*Department of Mathematics and Geospatial Science, RMIT University, Melbourne, VIC, Australia*
²*Department of Computer Science and Information Technology, RMIT University*
³*Department of Manufacturing, Materials and Mechatronics, RMIT University*
- 13:45 **Spacepharma's Satellites for Microgravity Research and Development**
Paul Kamoun, Shimon Amselem
SPRD, SPACEPHARMA, Herzliya, Israel
- 14:00 **Space science and engineering education at Nanyang Technological University through the SCOOBI mission**
Shanmugasundaram Selvadurai, Sarthak Srivastava,
 Kashyapa Bramha Naren Athreyas, Christopher Luwanga, Amal Chandran
School of Electrical and Electronics Engineering, Nanyang Technological University, Satellite Research Centre, Singapore
- 14:15 **INSPIRE: International Space Weather Research Using CubeSat Platforms**
Daniel Baker¹, Amal Chandran^{1,2}
¹*Laboratory for Atmospheric and Space Physics, University of Colorado Boulder, Boulder, Colorado, USA*
²*Satellite Research Centre, Nanyang Technological University, Singapore*
- 14:30 **IDEASSat – A 3U CubeSat for Ionospheric Science and Capacity Building**
Loren Chang¹, Chi-Kuang Chao¹, Amal Chandran², Cheng-Ling Kuo¹
¹*Institute of Space Science and Engineering, National Central University, Zhongli District, T'ao-yuan, Taiwan*
²*School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore*

- 14:45 **New Mexico Tech Student Satellite (NMTSat)**
Anders Jorgensen¹, J. Harris¹, A. Zucherman¹, S. Gill¹,
 A. Mayorga- Del Valle¹, W. Myers¹, S. Fennell¹, A. Nguyen¹, O. Schmelzel¹,
 M. Landavazo¹, J. A. Klepper¹, D. S. Guillette¹, H. B. Vo², D. Palmer³,
 R. M. Holmes³, E. Stromberg⁴, A. Reynolds⁴
¹USA, New Mexico Institute of Mining and Technology (New Mexico Tech)
²Vietnam, Vietnamese-German University, Ho Chi Minh City
³Nm, USA, Los Alamos National Laboratory, Los Alamos,
⁴Co, USA, Astra, Llc, Louisville

13:30-14:45 Session A.1 (2) Hall D
 Chairs: MSO: **Pierric Ferrier**, DO: **Philippe Crebassol**

- 13:30 **Multiples satellite observations of “Wind Pump” impacts on marine systems**
DanLing Tang¹, Yi Sui²
¹Guangdong Ley Lab of Ocean Remote Sensing, LTO, South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou, Guangdong, China
²Department of Oceanography, Dalhousie University, Halifax, Nova Scotia, Canada
- 13:45 **Tropika equatorial constellation for Weather and Space Weather Forecasting**
Amal Chandran, Tzu-Wei Fang
 Satellite Research Centre, School of EEE, Nanyang Technological University, Singapore, Select State, Singapore
- 14:00 **Constellation of Small Spacecraft for Radio Occultation Probing of Ionosphere and Atmosphere**
Ekaterina Tverdokhlebova, Alexander Yakovlev, Alexander Karelin,
 Victor Khartov, Vyacheslav Shuvalov
 Automatic Space Complexes, Central Research Institute of Machine Building, Korolev, Russia
- 14:15 **ANGELS Nanosatellite, from a Successful CDR up to its Launch**
Thibery Cussac¹, Laurene Gillot¹, Silvia Salas¹, Benjamin Pouilloux¹,
 Romain Mathieu¹, Michel Nonon¹, Dries Caluwaerts², Eric Dequeker²,
 Fabrice Lécina²
¹Orbital Systems Directorate, CNES, Toulouse, France
²Smallsats, HEMERIA, Toulouse, France
- 14:30 **Multispectral Arrays UV - LWIR**
David Harrison, Kevin Downing
 Space, Science & Astronomy, Materion Precision Optics, Westford, MA, USA

- 14:45 **Using SWARM Satellite Mission to Study the Effects of Large Tropical Cyclones on the Ionosphere**
Dmitry Chugunin, Victor I. Zakharov^{1,2}, Vyacheslav A. Pilipenko^{3,4},
 Valerii A. Grushin⁴
¹Faculty of Physics, M.V.Lomonosov's Moscow State University, Moscow, Russia
²LTWP, A.M. Obukhov Institute of Atmospheric Physics RAS, Moscow, Russia
³Lab. 402, O.Yu.Schmidt Institute of Physics of the Earth, Moscow, Russia
⁴Sect. 54, Space Research Institute (SRI) RAS, Moscow, Russia

15:00-15:30 Coffee Break and Poster Sessions for A.1, B.1, PCB.1

15:30-17:00 Session D.1 (3) **Hall A**
 Chairs: MSO: **Jaejin Lee**, DO: **Kyung-Joo Hwang**

- 15:30 **SandPIPR+ (Structure and Propagation of Ionospheric Patches in the polar Region) mission**
Kyoung-Joo Hwang
 Space Science and Engineering, Southwest Research Institute,
 San Antonio, Texas, USA

- 15:45 **Small Satellites for Next Generation Space Weather Measurements**
George Ho, Angelos Vourlidas
 Space Exploration, Johns Hopkins University Applied Physics Laboratory,
 Laurel, Maryland, USA

- 16:00 **Petitsat - A 6u Cubesat To Examine Ionospheric Plasma Density Irregularities**
Jeffrey Klenzing¹, Ryan Davidson², Gregory Earle³, Alexa Halford⁴,
 Sarah Jones¹, Carlos Martinis⁵, Nikolaos Paschalidis¹, Robert Pfaff¹,
 Jonathon Smith^{1,6}
¹Heliophysics Science Division, NASA / GSFC, Greenbelt, MD, USA
²Department of Electrical and Computer Engineering, Utah State University,
 Logan, UT, USA
³Department of Electrical and Computing Engineering, Virginia Tech,
 Blacksburg, VA
⁴Space Sciences Department, The Aerospace Corporation, Chantilly, VA,
 USA
⁵Center for Space Physics, Boston University, Boston, MA, USA
⁶Department of Physics, Catholic University of America, Washington, DC,
 USA

- 16:15 **Energetic Electron Precipitation Research with Nanosatellites of Moscow University**
Vasily Petrov, Michael Panasyuk, Vitaly Bogomolov, Anatoly Iyudin, Vladislav Osedlo, Michail Podzolko, Sergey Svertilov, Yurii Zaiko
Skobel'syn Institute of Nuclear Physics, Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia
- 16:30 **The Climatology of Anthropogenic and Natural VLF wave Activity in Space (CANVAS) CubeSat mission**
Robert Marshall¹, Austin Sousa¹, Scott Palo¹, David Malaspina²
¹*Aerospace Engineering Sciences, University of Colorado Boulder, Boulder, Colorado, USA*
²*Laboratory for Atmospheric and Space Physics, University of Colorado Boulder, Boulder, Colorado, USA*

15:30-17:00 Session B.1 (3) Hall B
 Chairs: MSO: **Maria Cristina Falvella**, DO: **Pietro Ubertini**

- 15:30 **Interplanetary by INPPS Flagship and Orbiting Satellite**
Frank Jansen, Colin Price, Alexander Semenkin, Lars Schanz, Igor Mitrofanov, Tim Brandt, Pospisil Stanislav, Ivan Stekl, Bergmann Benedikt, Alexander Semenkin, Alexander Solodukhin, Koroteev Anatoly, Garri Popov, Viacheslav Petukhov
- 15:45 **MarCO: Trailblazing Interplanetary Small Science**
Andrew Klesh, Joel Krajewski, John Baker
Solar System Exploration, NASA / Jet Propulsion Laboratory, Pasadena, California, USA
- 16:00 **Exploration of Titan by small planetary satellite**
Robin Singh, Soumya Dubey, Mayank Nautiyal
Department of Aerospace, University of petroleum and energy studies, Dehradun, Uttarakhand, India
- 16:15 **NEOShare: A Smallsat Mission to Explore the Diversity of Near-Earth Asteroids**
James Bell¹, Lindsay Wolff², Vishnu Reddy³, David Trilling⁴, Elizabeth Cantwell¹, David Thomas¹, Lon Levin², Scott Smas¹
¹*MILO Space Science Institute, Arizona State University, USA*
²*GEOshare, Lockheed Martin Space Systems, USA*
³*Lunar and Planetary Laboratory, University of Arizona, USA*
⁴*Department of Physics and Astronomy, Northern Arizona University, USA*

- 15:30 **Samara University Scientific-Educational Nanosatellite Program to Study High Atmosphere**
Igor Belokonov, Ivan Timbai, Andrey Kramlikh, Denis Avaryaskin, Igor Lomaka, Stepan Shafran
Space Research Department, Samara National Research University, Samara, Russian Federation, Russia
- 15:45 **SPACE HAUC: An Undergraduate CubeSat Mission to Demonstrate High Bandwidth Communication using a X-Band Phased-Array System**
Supriya Chakrabarti, Susanna Finn, Timothy Cook, Simthyrearch Dy, Sanjeev Mehta
Lowell Center for Space Science and Technology (LoCSST), University of Massachusetts, Lowell, Lowell, Massachusetts, USA
- 16:00 **Scientific and Educational Satellites SiriusSat in the CubeSat 1U Format**
Vitaly Bogomolov¹, Yuri Dement'ev¹, Roman Zharkikh², Anatoly Iyudin¹, Ivan Maksimov¹, Vladislav Osedlo¹, Sergey Svertilov¹
¹*Physical department, Skobeltsyn Institute of Nuclear Physics, M.V. Lomonosov Moscow State University, Moscow, Russia*
²*Sputniks, Sputniks Ltd, Moscow, Russia*
- 16:15 **Metasat: An Open Metadata Schema for Cubesat Missions/H3**
Nico Carver, Daina Bouquin, Katie Frey
John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA
- 16:30 **From a Rocket Experiment to a CubeSat Constellation: A Joint Venture of Scientists and University Students Building a Remote Sensing Instrument for Atmospheric Research**
Martin Kaufmann^{1,2}, Friedhelm Olschewski², Klaus Mantel³, Tom Neubert⁴, Oliver Wroblowski^{1,2}, Qiuyu Chen^{1,2}, Jilin Liu^{1,2}, Michael Deiml^{1,2,11}, Björn Rottland⁷, Rui Song^{1,2,12}, Daikang Wei^{1,2}, Qiucheng Gong^{1,2}, Jörn Ungermann¹, Manfred Ern¹, Yajun Zhu¹, Friedrich Wagner⁵, Denis Fröhlich^{1,4}, Florian Loosen^{5,13}, Heinz Rongen^{1,4}, Georg Schardt^{1,4}, Peter Knieling², Herbert Schneider⁷, Christian Monte⁶, Dieter Taubert⁶, Jinjun Shan⁸, Geshi Tang⁹, Brian Solheim¹⁰, Gordon Shepherd¹⁰, Ralf Koppmann², Martin Riese^{1,2}
¹*Institute of Energy and Climate Research (IEK-7), Research Center Juelich, Germany*
²*Institute for Atmospheric and Environmental Research, University of Wuppertal, Germany*
³*Optical Technologies, Max Planck Institute for the Science of Light, Germany*

⁴Central Institute for Engineering, Electronics and Analytics, Electronic Systems (ZEA-2), Research Center Juelich, Germany

⁵Institute of Optics, Information and Photonics, Friedrich-Alexander-Universitaet, Germany

⁶Department Detector Radiometry and Radiation Thermometry, Physikalisch-Technische Bundesanstalt, Germany

⁷Central Institute for Engineering, Electronics and Analytics, Engineering and Technology (ZEA-1), Research Center Juelich, Germany

⁸Department of Earth and Space Science and Engineering, York University, Canada

⁹Aerospace Flight Dynamics Laboratory, Beijing Aerospace Flight Control Center, China

¹⁰Centre for Research in Earth and Space Science, York University, Canada

¹¹now at, OHB System AG, Germany

¹²now at, University College London, UK

¹³now at, Carl Zeiss SMT GmbH, Germany

15:30-16:30 **Session A.1 (3)** **Hall D**
Chairs: MSO: **Pierric Ferrier**, DO: **Philippe Crebassol**

16:00 **Oneweb Satellites; Revolutionizing the Economics of Space Through Industrialization**
Randall Rose², [Steve Diamond](#)¹
¹Department of Systems Engineering, OneWeb Satellites, Inc., Exploration Park, FL, USA
²Division of Space Science and Engineering, Southwest Research Institute, San Antonio, Texas, USA

16:15 **The OptSat High End Micro Satellite Series**
[Meir Nissim-Nir](#), Erez Yacoby, Demitry, .Ehud Hayun
MBT Space Division, Israel Aerospace Industries, Yehud, Israel

17:15-18:05 **Plenary Session** **Hall A**
Thomas Zurbuchen (USA) - Keynote talk

18:15-19:30 **Opening Ceremony** **Exhibition Hall**

Morris Podolak - Program Chair
Lennard Fisk - President of COSPAR
Isaac ben Israel - Chairman Israel Space Agency
Avi Blasberger – The Israel Ministry of Science
Inbal Kreiss, IAI

TUESDAY, NOVEMBER 5, 2019

09:00-10:40 **Plenary Session** **Hall A**

09:00 - 09:50 **"Our Place in the Cosmos"**
Mario Livio (USA) - Keynote talk

09:50-10:40 **"Visiting the Sun's Outer Planets and Searching for the Nearest Earthlike Exoplanets"** **Hall A**
Jack Lissauer (USA) - Keynote talk

10:40-11:10 **Coffee and Poster sessions for A.2, A.5, B.2, D.1**

11:10-12:40 **Session D.1 (4)** **Hall A**
Chairs: MSO: **Jaejin Lee**, DO: **Kyung-Joo Hwang**

11:10 **AMICal Sat, ATISE and WFAI: Three Space Instruments for Auroral Monitoring**
Mathieu Barthelemy¹, Vladimir Kalegaev², Etienne Le Coarer¹, Elisa Robert¹
¹CSUG/IPAG, Grenoble Alpes University, Grenoble, France
²SINP, Moscow State University, Moscow, Russia

11:25 **Research on Ionospheric Optical Remote Sensing Detection Technology Based on Micro-nano Satellite**
Ruyi Peng^{1,2}, Liping Fu^{1,2}
¹Department of Beijing Key Laboratory of Space Environment Exploration, National Space Science Center, Chinese Academy of Sciences, Beijing, Beijing, China
²Department of Beijing Key Laboratory of Space Environment Exploration, National Space Science Center, Chinese Academy of Sciences, Beijing, Beijing, China

11:40 **AERO & VISTA: Demonstrating HF Radio Interferometry with Vector Sensors**
Michael Hecht, Phil Erickson, Frank Lind, Mary Knapp, Team The AERO and VISTA teams, Teams The AERO and VISTA, The AERO and VISTA Teams
Haystack Observatory, Massachusetts Institute of Technology, Westford, MA, USA

- 11:55 **The Enhanced Ion and Neutral Mass Spectrometer for the PetitSat CubeSat Mission**
Sarah Jones¹, Nikolaos Paschalidis¹, Timothy Cameron³, Paulo Uribe², Marcello Rodriguez², Dennis Chornay⁴, Kenth Santibanez Rivera², Edward Sittler¹
¹Heliophysics Science Division, NASA Goddard Space Flight Center, Greenbelt, MD, USA
²Applied Engineering and Technology Directorate, NASA Goddard Space Flight Center, Greenbelt, MD, USA
³Adnet Systems Inc., Adnet Systems Inc., Greenbelt, MD, USA
⁴University of Maryland, College Park, University of Maryland, College Park, College Park, MD, USA
- 12:10 **CubeSat Mission SOCRAT for the Monitoring of Natural Radiation Environment and its Impact on Electronics at Sun Synchronous LEO**
Ivan Zolotarev¹, Yuri Dementiev¹, Miroslav Havranek², Martin Kakona^{2,3}, Sergey Filippychev¹, Miroslav Finger⁴, Maria Marcisovska², Michal Marcisovsky², Mikhail Panasyuk, Oleg Peretyatko¹, Vasilii Petrov¹, Ondrej Ploc³, Ivan Pol'shikov¹, Petr Suchanek⁵, Lukas Tomasek², Yuri Zaiko¹, Vaclav Vrba²
¹Russia, Skobeltsyn Institute of Nuclear Physics of Lomonosov Moscow State University
²Czech Technical University, Faculty of Nuclear Sciences and Physical Engineering,, Czech Republic
³Czech Republic, Nuclear Physics Institute of the CAS
⁴Charles University, Faculty of Mathematics and Physics, Czech Republic
⁵Czech Republic, Space, evolving systems consulting s.r.o.
- 12:25 **A Microsatellite for Solar Wind Monitoring**
Anatoly Petrukovich, Natan Eismont, Maria Ryazantseva, Ivan Zimovets
 Space Plasma Physics, Space Research Institute, Moscow, Russia

11:10-12:40 Session A.2 **Hall B**
 Chairs: MSO: **Anthony Freeman**, DO: **Shuanggen Jin**

- 11:10 **Iceye's Micro-Satellite Sar Constellation: Near-Real Time Satellite Data for Earth Observation**
Penelope Kourkoulis, Pekka Laurila, Rafal Modrzewski
 ICEYE Ltd, Espoo, Finland
- 11:25 **RainCube: Radar Weather Observations from a Sustainable, Small Satellite Platform**
Shannon Statham, Eva Peral, Simone Tanelli, Oasmane O. Sy, Gian Franco Sacco, Shivani Joshi, Eastwood Im
 Jet Propulsion Laboratory, California Institute of Technology, CA, Pasadena, USA

- 11:45 **CloudCT: Spaceborne Scattering Tomography by A Large Formation of Small Satellites for Improving Climate Predictions**
Aviad Levis¹, Vadim Holodovsky¹, Yoav Y. Schechner¹, Eshkol Eytan², Ilan Koren², Anna Aumann³, Klaus Schilling³
¹Viterbi Faculty of Electrical Engineering, Technion - Israel Institute of Technology, Haifa, Israel
²Department of Earth and Planetary Sciences, Weizmann Institute of Science, Rehovot, Israel
³Space, Zentrum fuer Telematik e.V, Germany
- 12:00 **SmallSat Constellations for Earth Science – it’s about Timing**
Anthony Freeman
 Jet Propulsion Laboratory, California Institute of Technology, CA, Pasadena, USA
- 12:20 **Small Satellites for Sustainable Science and Development in Africa; Policy Perspectives**
Peter Ekweozoh, Anietie Ekanem
 Environmental Science and Technology, Federal Ministry of Science and Technology, Abuja, Federal Capital Territory, Nigeria

11:10-12:20 Session B .2 **Hall C**
 Chairs: MSO: **Young-Jun Choi**, DO: **Noah Brosch**

- 11:10 **Small Ultraviolet Payloads for Astronomy**
Rekshesh Mohan
 Astronomy, Indian Institute of Astrophysics, Bangalore, Karnataka, India
- 11:30 **Lunar Exploration with Cubesats: The Challenges and the Rewards**
Ana Gomez De Castro
 Space Astronomy Research Group - AEGORA, Universidad Complutense De Madrid, Madrid, None, Spain
- 11:50 **An Energetic Particle Monitor for Ice Giant Atmospheric Probes**
Nicolas Andre, Pierre Devoto, Quentin Neron, Lea Griton
 CNRS, UPS, CNES, Institut de Recherche en Astrophysique et Planetologie, IRAP, Toulouse, France

12:05

Geo-X : Geospace X-Ray Imager

Yuichiro Ezo¹, Ryu Funase², Harunori Nagata³, Yoshizumi Miyoshi⁴, Satoshi Kasahara⁵, Hiroshi Nakajima⁶, Ikuyuki Mitsuishi⁷, Kumi Ishikawa⁸, Junko Hiraga⁹, Kazuhisa Mitsuda¹⁰, Masaki Fujimoto¹¹, Munetaka Ueno¹², Masaki Numazawa¹, Daiki Ishi¹, Ryota Otsubo¹, Aoto Fukushima¹, Hikaru Suzuki¹, Tatsuya Yuasa¹, Sae Sakuda¹, Tomoki Uchino¹

¹Physics, Tokyo Metropolitan University, Japan

²Interdisciplinary Space Science, ISAS/JAXA, Japan

³Engineering Mechanical and Space Engineering, Hokkaido University, Japan

⁴ISEE, Nagoya University, Japan

⁵Earth and Planetary Science, University of Tokyo, Japan

⁶Physics, Kanto Gakuin University, Japan

⁷Physics, Nagoya University, Japan

⁸Spacecraft Engineering, ISAS/JAXA, Japan

⁹Physics, Kwansai Gakuin University, Japan

¹⁰Space Astronomy and Astrophysics, ISAS/JAXA, Japan

¹¹Solar System Sciences, ISAS/JAXA, Japan

¹²Space Exploration Innovation Hub Center, JAXA, Japan

12:40-13:40

Lunch

Dining Room

13:40-15:00

Session D.1 (5)

Chairs: MSO: **Jaemin Lee**, DO: **Kyung-Joo Hwang**

Hall A

13:40

ELFIN Mission Overview and First Results

Vassilis Angelopoulos, Ethan Tsai, Colin Wilkins, Ryan Caron, Andrei Runov, Jiang Liu, Xiaojia Zhang

Earth, Planetary, and Space Sciences, UCLA, Los Angeles, California, USA

13:55

Flight Demonstration of a Mini Ion and Neutral Mass Spectrometer Onboard the Exocube and Dellingr CubeSat Missions

Nikolaos Paschalidis, Sarah Jones, Marcello Rodriguez, Paulo Uribe,

Tim Cameron, Dennis Chornay, Ed Sittler, Alex Glocer

Heliophysics, NASA GSFC, USA

14:10

Constellation of Satellites to study Solar Dynamics and to Provide Ground Work in Order to Prevent Black Outs Caused by Coronal Mass Ejections

Vipul Mani, Ramesh Kumar, Ugur Guven

Aerospace Engineering, University of Petroleum and Energy Studies,

Dehradun, Uttarakhand, India

14:25

The SoSWEET-SOUP (SOlar, Space Weather Extreme EvenTs and Stratospheric Ozone Ultimate Profiles) Constellation Mission

Luc Dame¹, Mustapha Meftah¹, Alain Hauchecorne¹, Slimane Bekki¹, Philippe Keckhut¹, Abdenour Irbah¹, Alain Sarkissian¹, Marion Marchand¹, Rémi Thieblemont¹, Jean-Philippe Duvel², David Rogers³, Philippe Bove³, David Bolesee⁴, Nuno Pereira⁴, Gael Cessateur⁴

¹LATMOS/IPSL/CNRS, Paris-Saclay University, France

²Laboratoire de Meteorologie Dynamique, Ecole Normale Supérieure, France

³Nanovation, Chateaufort, France

⁴IASB, BIRA, Belgium

13:40-15:00

Session A.2 (2)

Hall B

Chairs: MSO: **Anthony Freeman**, DO: **Shuanggen Jin**

13:40

NASA's Earth Science Technology Validation on CubeSats and its Impact in Building Future Missions

Sachidananda Babu¹, Sachidananda Babu, Pamila Millar, Charles Norton², Robert Estep³, Pamila Millar¹, Robert Bauer¹

¹Earth Science Technology Office, NASA, Greenbelt, Maryland, USA

²Science Mission Directorate, NASA, Washington, DC, USA

³Goddard Space Flight Center, NASA, Greenbelt, MD, USA

14:00

HyTI: High Spectral Resolution Thermal Imaging from a 6U CubeSat platform

Robert Wright

Hawaii Institute of Geophysics and Planetology, University of Hawaii at Manoa, Honolulu, HI, USA

14:20

TGF and TLE observations from Small Satellite Constellation

Sergey Svertilov¹, Michail Panasyuk¹, Bogomolov Vitaly¹, Gali Garipov¹, Anatoly Iyudin¹, Pavel Klimov¹, Vladislav Osedlo¹, Vasiliy Petrov¹, Adaljat ogly Samedov², Tarlan Mammadzada³

¹Physical Department, Skobel'tsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow, Moscow, Russia

²Academy, Azerbaijan National Aviation Academy, Baky, Azerbaijan

³Azerkosmos, Azerkosmos, Baky, Azerbaijan

14:35

A GNSS Payload with Commercial-Off-The-Shelf Receivers for Cubesat Precise Orbit Determination

Kangkang Chen¹, Michael Meindl¹, Markus Rothacher¹, Flavio Kreiliger², Erich Styger², Marcel Joss², Sergio De Florio³, Lola López Gilabert³

¹ETH Zurich, Dept. of Civil, Environmental and Geomatic Engineering, Institute of Geodesy and Photogrammetry, Zurich, Schweiz, Switzerland

²Lucerne University of Applied Sciences and Arts, Lucerne School of

Engineering and Architecture, Lucerne, Schweiz, Switzerland

³Astrocast, space flight dynamics and operations at Astrocast SA, Lausanne, Schweiz, Switzerland

13:40-15:00

Session B.2 (2)

Hall C

Chairs: MSO: **Young-Jun Choi**, DO: **Noah Brosch**

13:40

Solar Neutron and Gamma-ray Spectroscopic Mission

Kazutaka Yamaoka¹, Hiroyasu Tajima¹, Kikuko Miyata², Takaya Inamori², Yoshinori Sasai¹, Hiroaki Kawahara³, Ji Hyun Park^{1,2}, Kazuhiro Nakazawa^{3,4}, Satoshi Masuda¹, Koji Matsushita⁵, Kazuya Itoh⁵, Daiki Nobashi^{1,3}, Hiromitsu Takahashi⁶, Kyoko Watanabe⁷

¹Institute for Space-Earth Environmental Research (ISEE), Nagoya University, Nagoya, Aichi, Japan

²Department of Aerospace Engineering, Graduate School of Engineering, Nagoya University, Nagoya, Aichi, Japan

³Department of Particle Physics and Astronomy, Graduate School of Science, Nagoya University, Nagoya, Aichi, Japan

⁴Kobayashi-Maskawa Institute for the Origin of Particle and the Universe (KMI), Nagoya University, Nagoya, Aichi, Japan

⁵Technical Center, Nagoya University, Nagoya, Aichi, Japan

⁶Department of Physical Science, Graduate School of Science, Hiroshima University, Higashi-Hiroshima, Hiroshima, Japan

⁷Department of Earth and Ocean Sciences, National Defence Academy of Japan, Yokosuka, Kanagawa, Japan

13:55

DSL: Interferometric Imaging with Linear microsatellite Array in Lunar Orbit

Jingye Yan¹, Xuelei Chen², Ji Wu¹, Li Deng¹, Lin Wu¹, Fei Zhao¹, Ailan Ian¹

¹National Space Science Center, Chinese Academy of Sciences, Beijing, China

²National Astronomical Observatories, Chinese Academy of Sciences, Beijing, China

14:10

Status of the PolarLight X-ray polarimeter in space

Hong Li

Department of Engineering Physics, Tsinghua University, Beijing, China

Center for Astrophysics, Tsinghua University, Beijing, China

14:25

Development of Advance Micropropulsion System for Cubesats and Nanosats

Vikrant Sharma¹, Navjeet Singroha¹, Vaishnavi Gautam¹, Pankaj Kumar¹, Sandeep Jangid^{1,2}

¹Aerospace Engineering, University of Petroleum and Energy Studies, Dehradun, Uttarakhand, India

²Instrumentation and Control, University of Petroleum and Energy Studies, Dehradun, Uttarakhand, India

14:40 **Simulation and Performance Analysis of CubeSat's Deep-space Optical Navigation System**
Taeyoung Kim, Hyochoong Bang
Department of Aerospace Engineering, KAIST, Daejeon, Daejeon, South Korea

15:00-15:30 Coffee Break

15:30-17:00 Session A.5 **Hall A**
Chairs: MSO: **Y. Tony Song**, DO: **Shuanggen Jin**

15:30 **IONOGLOW: New Insight for Ionospheric Detection of Tsunamis by Airglow Camera from Space** (Invited)
Giovanni Occhipinti¹, Pierdavide Coïsson¹, Yuto Tomida^{1,2}, Jonathan Makela³, Matthew Grawe³, Lucie Rolland⁴, Josiane Costeraste⁵, Louise Lopes⁵, Mioara Manda⁵, Francois Schindele⁶, Pierre Simoneau⁷, Raphael Garcia⁸, Richard Eastes⁹, Bill McClintock⁹, Philippe Lognonné¹, Gauthier Hulot¹
¹*Institut de Physique du Globe de Paris, Université de Paris, Paris, France*
²*, Tokyo Gakugei University, Tokyo, Japan*
³*College of Engineering, University of Illinois, Urbana, USA*
⁴*Geoazur, Observatoire de la Cote Azure, Nice, France*
⁵*Centre National d'Etudes Spatiales, CNES, France*
⁶*CEA, Commissariat à l'Energie Atomique et aux énergies alternatives, France*
⁷*ONERA, Office National d'Etudes et Recherches Aerospatiales, Palaiseau, France*
⁸*ISAE, Supaero, Toulouse, France*
⁹*GOLD team, University of Colorado, Boulder, USA*

15:50 **Close Up Imaging Simulation of Low-Altitude ENA Emission during Geomagnetic Substorm**
Li LU, Qing-Long YU, Qi LU
Laboratory of Space Environment Exploration, National Space Science Center of the Chinese Academy of Sciences, Beijing, Beijing, China

16:05 **Optimal Design of an Ideal Instrumentation Package for High-Resolution Characterization of Wildfires from Small-Satellite Constellations**
Charles Ichoku¹, Jun Wang², Tilak Hewagama^{3,4}, James Leitch⁵, Michael Veto⁵, Jennifer Lee⁵
¹*Interdisciplinary Studies/Atmospheric Sciences, Howard University, Washington, DC, USA*
²*Chemical & Environmental Engineering & Physics, University of Iowa, Iowa City, IA, USA*
³*Planetary Systems Laboratory (693), NASA Goddard Space Flight Center, Greenbelt, MD, USA*
⁴*Astronomy, University of Maryland, College Park, MD, USA*
⁵*Engineering, Ball Aerospace, Boulder, CO, USA*

16:20 **On the Need of The Use of Data from Small Satellites in Elucidating Ionospheric Phenomena During Very Intense Geomagnetic Storms**
Victor Chukwuma, Department of Physics, Olabisi Onabanjo University, Ago Iwoye, Ogun State, Nigeria

16:35 **Orbiting Nano-satellites for Earthquake Prediction (ONSEP)**
Visweswaran Karunanithi¹, Chris Verhoeven¹, Mark Bentum^{2,3}, Raj Thilak Rajan¹, Prem Sundaramoorthy^{1,2}, Maneesh Kumar Verma¹
¹Electrical Engineering, Mathematics and Computer Science, Delft University of Technology, Delft, Zuid Holland, Netherlands
²Electrical Engineering, Eindhoven University of Technology, Eindhoven, Netherlands
³Radio group, Netherlands Foundation for Research in Radio Astronomy (ASTRON), Dwingeloo, Netherlands

15:30-17:15 **Session A.2 (3)** **Hall B**
Chairs: MSO: **Anthony Freeman**, DO: **Shuanggen Jin**

15:30 **CYGNSS Smallsat Constellation for Severe Storm and Hydrologic Science Applications**
Randall Rose^{1,5}, Chris Ruf², Mahta Moghaddam³, Derek Posselt⁴
¹Space Science and Engineering, Southwest Research Institute, San Antonio, Texas, USA
²Department of Climate and Space Sciences and Engineering, University of Michigan, Ann Arbor, MI, USA
³Viterbi School of Engineering, University of Southern California, Los Angeles, CA, USA
⁴Department of Atmospheric Physics and Weather, Jet Propulsion Laboratory/Caltech, Pasadena, CA, USA
⁵Division of Space Science and Engineering, Southwest Research Institute, San Antonio, Texas, USA

15:50 **New Small Satellite Passive Microwave Radiometer Technology for Future Constellation Missions**
Shannon Brown¹, Wes Berg², Xavier Bosch¹, Todd Gaier¹, Richard Hodges¹, Pekka Kangaslahti¹, Amarit Kitiyakara¹, Boon Lim¹, Sidharth Misra¹, Sharmila Padmanabhan¹, Isaac Ramos¹, Steve Reising², Alan Tanner¹, Chandrasekaran Venkatachalam²
¹Microwave Systems, Jet Propulsion Laboratory, Pasadena, CA, USA
²ECE, Colorado State University, Fort Collins, CA, USA

16:10 **Thermospheric Variations from GNSS and Accelerometer Observations on GRACE and Swarm**
Shuanggen Jin
Center for Astro-Geodynamics, Shanghai Astronomical Observatory, Chinese Academy of Sciences, Shanghai, China

16:25

SigNals of Opportunity: P-band Investigation (SNOOPI)

James Garrison¹, Jeffrey Piepmeier², Rashmi Shah³, Cynthia Firman², David Spencer¹, Roger Banting², Manuel Vega², Kameron Larsen³, Benjamin Nold¹, [Sachidananda Babu](#)⁴

¹*School of Aeronautics and Astronautics, Purdue University, West Lafayette, In, Usa*

²*Goddard Space Flight Center, NASA, MD, Greenbelt, USA*

³*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA*

⁴*Earth Science Technology Office, NASA, MD, Greenbelt, USA*

16:45

Small Satellite Enabled Solution for Cloud Characterization and Weather Imaging

[Randall Rose](#)¹, Pete Roming¹, Steve Diamond²

¹*Division of Space Science and Engineering, Southwest Research Institute, San Antonio, Texas, USA*

²*Department of Systems Engineering, OneWeb Satellites, Inc., Exploration Park, FL, USA*

17:00

The CubeSat Radiometer Radio Frequency Interference Technology (CubeRRT) Validation Mission: First Ever Space-borne Demonstration of Real-Time Interference Filtering

[Sidharth Misra](#)¹, Shannon Brown¹, Joel Johnson², Christopher Ball², Robert Jarnot¹, Rudi Bendig¹, Carl Felten¹, ChiChih Chen², Christa McKelvey², Graeme Smith², Andrew O'Brien², Mark Andrews², Jeffrey Piepmeier³, Kevin Horgan³, Quenton Bonds³, Jinzheng Peng³, Michael Solly³, Joseph Knuble³, Jonathon Kocz⁴, Doug Laczkowski⁵, Ervin Krauss⁵

¹*Instrument Electronics and Software, JPL CalTech, USA*

²*ECE, Ohio State University, USA*

^{3*}*NASA GSFC, USA*

⁴*Astrophysics, Caltech, USA*

⁵*BCT, BCT, USA*

- 15:30 **NanoGam - a Non-Uniform Voxel Pattern for Monitoring and Localizing Gamma-Ray Transients**
Lee Yacobi, Ehud Behar, Shlomit Tarem, Roi Rahin
Physics, Technion, Haifa, Israel
- 15:45 **Science prospects of the improved X-ray Detector iXRD on 3U CubeSat Sharjah-Sat-1**
Emrah Kalemci¹, A. Rustem Aslan²,
Ayhan Bozkurt¹, Ilias Fernini³, M. Erdem Bas⁴, M. Deniz Aksulu⁵, Milad Diba¹,
Kaan Veziroglu¹, A. Murteza Altingun¹, Sibel Turkoglu²
¹*Faculty of Engineering and Natural Sciences, Sabanci University, Istanbul, Turkey*
²*Faculty of Aeronautics and Astronautics, Istanbul Technical University, Istanbul, Turkey*
³*Research Laboratories and Observatory, Sharjah Center for Astrophysics and Space Sciences, Sharjah, United Arab Emirates*
⁴-, *ERTEK Space Systems Ltd., Istanbul, Turkey*
⁵*Anton Pannekoek Institute of Astronomy, University of Amsterdam, Amsterdam, Netherlands*
- 16:00 **Directed Energy Propulsion - The Path to Radical Advancement**
Philip Lubin
Physics, Physics Dept - UC SantaBarbara, Santa Barbara, California, USA

WEDNESDAY, NOVEMBER 6, 2019

09:00-10:15 Plenary Session **Hall A**

09:00 - 09:50 **“Small Satellites for Space Science (4S), a COSPAR Scientific Roadmap”**
Rudolf von Steiger - Keynote talk

09:50-10:15 **“The Beresheet Lunar Lander Story”**
Yoav Landsman - Keynote talk

10:15-10:45 Coffee Break

10:45-12:30 Session A.2 (4) **Hall A**
Chairs: MSO: **Anthony Freeman**, DO: **Shuanggen Jin**

10:45 **Calibration and Validation for Small Satellites**
Jack Kaye
NASA HQ, Science Mission Directorate, Earth Science Division, Washington, DC, USA

11:00 **Applications of PlanetScope Constellation Dove CubeSats for Hazards and Climate Monitoring**

C.K. Shum¹, Tarig Ali², Xiaobin Cai³, Rebecca Gianotti⁴, Yuanyuan Jia⁵, Marty Kress⁶, Joseph Mascaro⁷, Kuo-Hsin Tseng⁸, Zhifeng Yu⁹

¹*Division of Geodetic Science, School of Earth Sciences, The Ohio State University, Columbus, Ohio, USA*

²*Geospatial Analysis Center, American University of Sharjah, Sharjah, Sharjah, United Arab Emirates*

³*Division of Geodetic Science, School of Earth Sciences, The Ohio State University, Columbus, Ohio, USA*

⁴*Global Water Institute, The Ohio State University, Columbus, Ohio, USA*

⁵*Division of Geodetic Science, School of Earth Sciences, The Ohio State University, Columbus, Ohio, USA*

⁶*Global Water Institute, The Ohio State University, Columbus, Ohio, USA*

⁷*Program Manager for Impact Initiatives, Planet Inc., San Francisco, California, USA*

⁸*Center for Space and Remote Sensing Research, National Central University, Taipei, Taoyuan, Taiwan*

⁹*Division of Geodetic Science, School of Earth Sciences, The Ohio State University, Columbus, Ohio, USA*

11:20 **Studying Earth Landscapes from Space with High Resolution using Small Satellite Constellations**

Garik Gutman
NASA, HQ, Washington, DC, USA

- 11:35 **IAI's Image Analytics tools for Space Imagery**
Tal Feingersh
R&D, IAI, Israel
- 11:50 **Crop RS-Met: A soil water content model for crop fields driven by high temporal satellite vegetation index**
David Helman¹, Itamar Lensky², Yaron Michael², David J Bonfi³
¹*Earth and Planetary Sciences, Johns Hopkins University, Baltimore, Maryland, USA*
²*Geography & Environment, Bar-Ilan University, Ramat Gan, Israel*
³*Vegetable and Field Crop Research, Agricultural Research Organization, Gilat Research Center, Gilat, Israel*
- 12:05 **Global Observations from a Science-Quality Passive Millimeter-wave Atmospheric Sounder on a CubeSat: Temporal Experiment for Storms and Tropical Systems Demonstration (TEMPEST-D)**
 Steven C. Reising¹, Todd C. Gaier³, Shannon T. Brown³, Sharmila Padmanabhan³, Christian D. Kummerow², V. Chandrasekar¹, Wesley Berg², Boon H. Lim³, Cate Heneghan³, Richard Schulte², Yuriy Goncharenko¹, Matthew Pallas⁴, Doug Laczkowski⁴, Austin Bullard⁴
¹*Electrical and Computer Engineering, Colorado State University, Fort Collins, CO, USA*
²*Atmospheric Science, Colorado State University, Fort Collins, CO, USA*
³*Jet Propulsion Laboratory, NASA/Caltech, Pasadena, CA, USA*
⁴*Blue Canyon Technologies, Inc., Boulder, CO, USA*

10:45-12:30 Session D.1 (3) Hall B

Chairs: MSO: **Jaejin Lee**, DO: **Kyung-Joo Hwang**

- 10:45 **Space Weather Research Missions with Small Satellites in China**
Chi Wang
State Key Laboratory of Space Weather, National Space Science Center, CAS, Beijing, China
- 11:05 **The Possibility to Measure the Plasma Density and its Fluctuations in the Ionosphere on Cubsats using Radiophysical Techniques**
Dmitry Chugunin^{1,2}, Alexander Chernyshov^{1,2}, Mikhail Mogilevsky¹, Anatoly Petrukovich¹
¹*Space Plasma Physics, Space Research Institute of the Russian Academy of Sciences, Moscow, Russian Federation, Russia*
²*West Department, West Department of Institute of Terrestrial Magnetism, Ionosphere, and Radiowave Propagation, Kaliningrad, Russia*

- 11:20 **Advanced Miniaturised Sensors for Commercial and Scientific Nanosatellite Missions**
Dhirendra Kataria
Space and Climate Physics, Mullard Space Science Laboratory, University College London, Dorking, Surrey, UK
- 11:35 **The Development of a Low-Voltage, Ultra-Compact Plasma Spectrometer**
Amy Keesee¹, Earl Scime², Derek Thompson², Cuyler Beatty², Greg Wagner³, Steve Ellison³, Vernon Cottles³, Matt Dugas³
¹*Physics & Astronomy and Space Science Center, University of New Hampshire, Durham, New Hampshire, USA*
²*Physics & Astronomy, West Virginia University, Morgantown, West Virginia, USA*
³*ARC Nano, Advanced Research Corporation, White Bear Lake, Minnesota, USA*
- 11:50 **Spatial - Temporal Study of Plasma-Waves and Ionospheric Parameters using Microsatellites**
Stanislav I Klimov¹, Oleg Vaisberg¹, Alexander Galka², Vladimir Gotlib¹, Valery Grushin¹, Maxim Dolgonosov¹, Lev Zelenyi¹, Valery Korepanov³, Alexander Kostrov², Janos Lichtenberger^{4,5}, Dmitry Moiseenko¹, Janos Nagy⁶, Denis Novikov¹, Peter Szegedi^{4,7}, Nathan Eismont¹
¹*Space Plasma Physics Department, Space Research Institute of the RAS, Moscow, Russia*
²*Department of Geophysical Electrodynamics, Applied Physics Institute of the RAS, Nizhny Novgorod, Russia*
³*LEMI, Institute for Space Research of NAS and SSA of Ukraine, Lviv, Ukraine*
⁴*Department Geophysics and Space Sciences, Eötvös University, Budapest, Hungary*
⁵*Geophysical, Geodetic and Geophysical Institute of HAS, Sopron, Hungary*
⁶*Particles, Wigner Research Centre for Physics, HAS, Budapest, Hungary*
⁷*BL, BL Electronics LTD., Budapest, Hungary*

10:45-12:30 Session B.1 (3) Hall C
 Chairs: MSO: **Maria Cristina Falvella**, DO: **Pietro Ubertini**

- 10:45 **Update of CSES Mission**
Xuhui Shen¹, Zhima Zeren¹, Fan Jiang²
¹*The Center for Satellite Application in Earthquake Science, Institute of Crustal Dynamics, China Earthquake Administration, Beijing, China*
²*Committee on Science and Technology, China Aerospace Science and Technology Group, Beijing, China*

- 11:05 **Small Satellites for Earth Observation: A Perspective From JPL/NASA**
Cinzia Zuffada, Marco Quadrelli, Charles Norton, Anthony freeman, Anthony Freeman
California Institute of Technology, Jet Propulsion Laboratory, Pasadena, California, USA
- 11:20 **Exploration of Enceladus through constellation of CubeSats**
Vipul Mani
Aerospace Engineering, University of Petroleum and Energy Studies, Dehradun, Uttarakhand, India
- 11:35 **Qcm Sensors for Contamination Monitoring in Support to Next Cubesats and Small Satellites Missions**
 Fabrizio Dirri¹, Ernesto Palomba¹, Andrea Longobardo¹, David Biondi¹, Angelo Boccaccini¹, Emiliano Zampetti², Bortolino Saggini³, Diego Scaccabarozzi³
¹*Institute for Space Astrophysics and Planetology (IAPS), National Institute for Astrophysics (INAF), Rome, Italy*
²*Institute of Atmospheric Pollution Research (IIA), National Research Council (CNR), Rome, Italy*
³*Polo Territoriale di Lecco, Polytechnic of Milan, Lecco, Italy*
- 11:50 **Democratizing Solar System Exploration, Using Low-cost Interplanetary Explorers**
Leon Alkalai, Dhack Muthulingam, Sonia Hernandez
Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California, USA
- 12:05 **Achievements and Future Plan of JAXA's Interplanetary CubeSats and Micro-sats**
Ryu Funase
Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Sagami-hara, Kanagawa, Japan
- 12:20 **Mini Array Satellites to Reach and Explore and Harbor Nearby Trough Going Icy Asteroid**
 Daniele Fargion
Dept. of Physics Rome University, Sapienza

10:45-12:30 **A.1 (4)** **Hall D**
Chairs: MSO: **Pierric Ferrier**, DO: **Philippe Crebassol**

- 10:45 **Monitoring the Earth's Magnetic Field and Ionosphere with LEO Nanosatellites: the NanoMagSat Project**
Gauthier Hulot¹, Jean-Michel Léger², Pierre Vigneron¹, Thomas Jager², François Bertrand², Pierdaviide Coisson¹, Frédéric Estève³, Benoit Faure³
¹*Equipe de Géomagnétisme, Université de Paris, Institut de physique du globe de Paris, CNRS, Paris, France*
²*Département Systèmes, CEA Leti, Grenoble, France*
³*Centre Spatial de Toulouse, Centre National d'Etudes Spatiales, Toulouse, France*
- 11:00 **Spherical Picosatellite for Monitoring of High Atmosphere Density**
Jordi Gutierrez¹, Igor Belokonov², Carlos Lledó¹, Pilar Gil-Pons¹, Ivan Timbai², Elena Barinova², Denis Avariaskin²
¹*Department of Physics, Universitat Politècnica de Catalunya, Castelldefels, Barcelona - Barcelona, Spain*
²*Inter-University Department of Space Research, Samara University, Samara, Russia*
- 11:15 **The Integrated Standard Imager for Microsatellites (iSIM): An agile, High-Resolution, Multispectral EO Camera for the New Constellations of Small Satellites**
Alvaro Gimenez³, Rafael Guzmán^{1,2}, Eider Ocerin², Aitor Conde²
¹*Department of Astronomy, University of Florida, Gainesville, Florida, USA*
²*Parque científico UPV, Satlantis Microsystems, Spain, Bizkaia, Spain*
³*Senior discipline scientist, International Space Science Institute, Bern, Switzerland*

12:30-13:30 **Lunch** **Dining Room**

13:30 **Excursion**

THURSDAY, NOVEMBER 7, 2019

09:00-09:50 Plenary Session Hall A

"Space Technology to the Power of Hundreds"
Agnieszka Lukaszczyk - Keynote talk

09:50-10:45 Session E.1 Hall A
Chairs: MSO: **Michel Boër, DO: Pietro Ubertini**

09:50 **Italian Assets for Space Science and Exploration with Cubesats**

Maria Cristina Falvella, Alessandra Di Cecco, Marta Albano
Agenzia Spaziale Italiana (ASI)

10:10 **Six years of stellar astrophysics with BRITE Constellation**

Gregg Wade
Physics and Space Science, Royal Military college of Canada, Kingston, Ontario, Canada

10:30 **The HERMES project (High Energy Rapid Modular Ensemble of Satellites): probing space - time quantum foam and hunting for gravitational wave electromagnetic counterparts**

Luciano Burderi¹, Andrea Sanna¹, Tiziana Di Salvo², Fabrizio Fiore³,
Alessandro Riggio¹, Maria Barbara Negri⁴, Simone Pirrotta⁴, Simonetta Puccetti⁴

¹*Physics, University of Cagliari, Monserrato, Sardinia, Italy*

²*Physics and Chemistry, University of Palermo, Palermo, Sicily, Italy*

³*Osservatorio Astronomico di Trieste, INAF, Trieste, Italy*

⁴*Unità Esplorazione e Osservazione dell'Universo, Italian Space Agency, Rome, Italy*

09:50-10:45 Session A.3 Hall B
Chairs: MSO: **Daniel Rosenfeld, DO: Céline Cornet**

09:50 **Formations of Small Satellites to Characterize 3D Cloud Properties: TOM and CloudCT**

Klaus Schilling¹, Yoav Schechner², Ilan Koren³

¹*Spacecraft Design Department, Zentrum für Telematik, Würzburg, Bavaria, Germany*

²*Electrical Engineering Faculty, Technion - Israel Institute of Technology, Haifa, Israel*

³*Department of Earth and Planetary Sciences, Weizmann Institute of Science, Rehovot, Israel*

10:10

Polarimetric Detection of Super-thin Clouds and Dust Using CubeSats

Gorden Videen¹, Wenbo Sun², Yongxiang Hu³, Rosemary R. Baize³, Ali Omar³, Snorre A. Stamnes³, Sungsoo S. Kim⁴, Chae Kyung Sim⁴, Young-Jun Choi⁵, Minsup Jeong⁵

¹Battlefield Environment Division, Army Research Laboratory, Adelphi, MD, USA

²Langley Research Center, Science Systems and Applications Inc., Hampton, VA, USA

³Langley Research Center, NASA, Hampton, VA, USA

⁴Humanitas College, Kyung Hee University, Yongin-shi, Kyungki-do, South Korea

⁵Space Science Division, Korea Astronomy and Space Science Institute, Yuseong-gu, Daejeon, South Korea

10:25

C3IEL: Cluster for Climate and Cloud Imaging of Evolution and Lightning, an Innovative Way to Observe Clouds and Their Environment

Daniel Rosenfeld¹, Céline Cornet², Shmaryahu Aviad³, Philippe Crebassol⁴, Paolo Dandini², Eric Defer⁵, Christine Fallet⁴, Vadim Holodovsky⁶, Aviad Levis⁶, Avner Kaidar¹⁰, Colin Price⁷, Didier Ricard⁸, Yoav Schechner⁶, Pierre Tabary⁴, Yoav Yair⁹

¹Institute of Earth Sciences, The Hebrew University of Jerusalem, Jerusalem, Israel

²Laboratoire d'Optique Atmosphérique, Université de Lille/CNRS, Villeneuve d'Ascq, France

³ISA, Israel Space Agency, Tel Aviv, Israel

⁴Centre National d'Etudes Spatiales, CNES, Toulouse, France

⁵Laboratoire d'Aérodynamique, CNRS, Toulouse, France

⁶Viterbi Faculty of Electrical Engineering, Technion, Israel Institute of Technology, Haifa, Israel

⁷Department of Geosciences, Tel Aviv University, Tel Aviv, Israel

⁸CNRM, Météo-France-CNRS, Toulouse, France

⁹Interdisciplinary Center, IDC, Herzliya, Israel

¹⁰Asher Space Research Institute

09:50-10:50

Session A.4

Hall C

Chairs: MSO: **Gérard Dedieu**, DO: **Arnon Karnieli**, DO: **Jean-Baptiste Féret**

09:50

VEN μ S Mission Overview

Michel Dejus¹, Sophie Pelou¹, Jean Louis Raynaud¹, Arthur Dick¹, Gérard Dedieu², Olivier Hagolle², Laurent Mongin⁵, Joel Recoules⁶, Amandine Rolland⁵, Philippe Maisongrande¹, Ehud Hayun³, Arnon Karnieli⁴

¹CNES, CNES, France

²CESBIO, CESBIO, France

³space division, MBT, Israel

⁴Sede Boker Campus, Ben Gurion University of the Negev, Israel

⁵Thales Services, Thales Services, France

⁶Akka Technologies, Akka Technologies, France

- 10:05 **The VEN μ S Mission: A Tool for The Scientists, A Contribution to Prepare the Next Generation of Sentinel 2**
Gerard Dedieu¹, Arnon Karnieli², Olivier Hagolle¹
¹CESBIO, Unité mixte CNES-CNRS-IRD-UPS, Toulouse University, Toulouse, France
²The Remote Sensing Laboratory, Jacob Blaustein Institute for Desert Research, Ben Gurion University of the Negev, Sede Boker, Israel
- 10:20 **VEN μ S observations over Israel**
Arnon Karnieli
The Remote Sensing Laboratory, Ben Gurion University, Sede Boker Campus, Israel
- 10:45-11:15 Coffee and Poster sessions for A.3, A.4, E.1, PRBEM.1**
-
- 11:15-12:00 Session E.1 (2)** **Hall A**
Chairs: MSO: **Michel Boër**, DO: **Pietro Ubertini**
-
- 11:15 **Novel solar soft X-ray imaging spectroscopy from a CubeSat platform**
Amir Caspi¹, Albert Shih², Harry Warren³, Daniel Seaton⁴, James Klimchuk², Thomas Woods⁵, James Mason⁵, Marek Steslicki⁶, Szymon Gburek⁶, Janusz Sylwester⁶, Craig DeForest¹
¹Planetary Science Directorate, Southwest Research Institute, Boulder, CO, USA
²Goddard Space Flight Center, NASA, Greenbelt, MD, USA
³Space Science Division, Naval Research Laboratory, Washington, DC, USA
⁴CIRES, University of Colorado, Boulder, CO, USA
⁵LASP, University of Colorado, Boulder, CO, USA
⁶Space Research Centre, Polish Academy of Sciences, Wrocław, Poland
- 11:30 **Cubesats for UV astronomy**
Noah Brosch
Physics & Astronomy, Tel Aviv University, Tel Aviv, Sharon, Israel
- 11:45 **SEEJ: Smallsat Exploration of the Exospheres of Nearby Hot Jupiters**
Scott Wolk¹, Jae-Sub Hong¹, Suzanne Romaine¹, Almus Kenter¹, Christopher Moore¹, Jeremy Drake¹, Vinay Kashyap¹, Bradford Wargelin¹, Martin Elvis¹, Elaine Winston¹, Katja Poppenhaeger², Ignazio Pillitteri³
¹High Energy, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA
²Astrophysics, University of Potsdam, Potsdam, Germany
³Palermo, INAF-Osservatorio Astronomico, Palermo, Sicily, Italy

- 11:15 **Geometric Aspects of Stereoscopic Spaceborne Imaging of Dynamic Clouds in the CLOUD Experiment**
Vadim Holodovsky¹, Michael Fisher¹, Yoav Y. Schechner¹, Daniel Rosenfeld², Aviad Levis¹
¹*Viterbi Faculty of Electrical Engineering, Technion - Israel Institute of Technology, Haifa, Israel*
²*Institute of Earth Sciences, The Hebrew University of Jerusalem, Jerusalem, Israel*
- 11:30 **Maritime Aerosol Network as a component of AERONET – an opportunity for collaboration**
Alexander Smirnov¹, Brent Holben¹, Stefan Kinne², Tymon Zielinski³, Georgiy Stenchikov⁴, Vladimir Radionov⁵, Sergey Sakerin⁶, Michael Ondrusek⁷, Giuseppe Zibordi⁸, Robert Frouin⁹, William Landing¹⁰, Derek Sowers¹¹, Norman Nelson¹², Emmanuel Boss¹³, Robyn Schofield¹⁴, Michael Harvey¹⁵, Paul Zieger¹⁶, Violeta Slabakova¹⁷, Simon Belanger¹⁸, Mikhail Krinitsky¹⁹, Anja van der Plas²⁰, Steven Broccardo²¹, Joaquim Goes²², Ruhi Humphries²³, Stephanie Fiedler², Francois Dulac²⁴, Philippe Goloub²⁵, Patrick Disterhoft²⁶, Ilya Slutsker¹, David Giles¹, Norman O'Neill²⁷, Thomas Eck¹
¹*Biospheric Sciences Laboratory, NASA Goddard Space Flight Center, Greenbelt, Maryland, USA*
²*Atmosphere in the Earth System, Max Planck Institute for Meteorology, Hamburg, Germany*
³*Climate and Ocean Research and Education Unit, Institute of Oceanology, Sopot, Poland*
⁴*Division of Physical Sciences and Engineering, King Abdulla University of Science and Technology, Thuwal, Saudi Arabia*
⁵*Department of Meteorology, Arctic and Antarctic Research Institute, Saint Petersburg, Russia*
⁶*Atmospheric Optics Laboratory, Institute of Atmospheric Optics, Tomsk, Russia*
⁷*Satellite Ocean Sensors Branch, NOAA Center for Satellite Applications and Research, College Park, Maryland, USA*
⁸*Directorate for Sustainable Resources, Joint Research Centre of the European Commission, Ispra, Italy*
⁹*Climate, Atmospheric Science & Physical Oceanography, Scripps Institution of Oceanography, La Jolla, California, USA*
¹⁰*Department of Earth, Ocean, and Atmospheric Science, Florida State University, Tallahassee, Florida, USA*
¹¹*Center for Coastal & Ocean Mapping, NOAA Office of Ocean Exploration and Research, Durham, New Hampshire, USA*

¹²Earth Research Institute, University of California, Santa Barbara, Santa Barbara, California, USA

¹³School of Marine Sciences, University of Maine, Orono, Maine, USA

¹⁴School of Earth Sciences, University of Melbourne, Parkville, Australia

¹⁵Atmosphere Center, National Institute of Water and Atmospheric Research, Wellington, New Zealand

¹⁶Atmospheric Science Unit, Stockholm University, Stockholm, Sweden

¹⁷Department of Ocean Technologies, Institute of Oceanology, Varna, Bulgaria

¹⁸Département de biologie, chimie et géographie, Université du Québec à Rimouski, Rimouski, Québec, Canada

¹⁹Sea-Air Interaction and Climate Laboratory, Institute of Oceanology, Moscow, Russia

²⁰Subdivision Environment, Ministry of Fisheries & Marine Resources, Swakopmund, Namibia

²¹Climatology Research Group, North-West University, Potchefstroom, South Africa

²²Department of Marine Biology and Paleoenvironment, Lamont Doherty Earth Observatory at Columbia University, Palisades, New York, USA

²³Climate Science Centre, Commonwealth Scientific and Industrial Research Organisation, Aspendale, Australia

²⁴Chimie Atmosphérique Expérimentale, Laboratoire des Sciences du Climat et de l'Environnement, Gif-sur-Yvette, France

²⁵Laboratoire d'Optique Atmosphérique, Université de Lille, Villeneuve d'Ascq, France

²⁶Global Monitoring Division, NOAA Earth System Research Laboratory, Boulder, Colorado, USA

²⁷Département de géomatique appliquée, Université de Sherbrooke, Sherbrooke, Québec, Canada

11:45

Using a single band Nano Satellite for Earth Observations (EO): Lessons learnt from BGUSAT

Shimrit Maman¹, Eran Gurfinkel³, Aviran Sadon¹, Dan G. Blumberg¹, Colin Price², Stanley Rotman¹, Sivan Isaacson¹

¹Earth and Planetary Image Facility, Ben-Gurion University of the Negev, Israel

²Department of Geosciences, Tel-Aviv University, Israel

³MBT Space, IAI, Israel

Chairs: MSO: **G rard Dedieu**, DO: **Arnon Karnieli**, DO: **Jean-Baptiste F ret**

- 11:15 **VEN S Production and Image Quality Monitoring Operations**
Jean-Louis Raynaud¹, Sophie Pelou¹, Michel Dejus¹, Arthur Dick¹, Renaud Binet¹, Laurent Mongin³, Joel Recoules⁴, Amandine Rolland³, Gerard Dedieu², Olivier Hagolle², Philippe Crebassol¹, Philippe Gamet¹
¹Earth Observation, Centre National d'Etudes Spatiales, TOULOUSE, France
²Earth Observation, Centre d'Etudes Spatiales de la BIOSph re, France
³OIC, THALES SERVICES, TOULOUSE, France
⁴Division Digital Application Design, AKKA, TOULOUSE, France
- 11:30 **VEN S: Specificities of Image Quality and In-Orbit Calibration Monitoring**
Arthur Dick¹, Philippe Gamet¹, S'bastien Marcq¹, Olivier Hagolle^{1,2}, Jean-Louis Raynaud¹, Sophie Pelou¹, Renaud Binet¹, Amandine Rolland³, Laurent Mongin³, Jean-Pascal Burochin⁴, Michel Dejus¹, G'rrard Dedieu^{1,2}
¹Physics of Optical Measurement, Centre National d'Etudes Spatiales (CNES), Toulouse, France
²Physics of Optical Measurement, Centre d'Etudes Spatiales de la BIOSph're (CESBIO), Toulouse, France
³Physics of Optical Measurement, Thales Services, Toulouse, France
⁴Physics of Optical Measurement, Magellium, Toulouse, France
- 11:50 **DEM Generation from Native Stereo VEN S Acquisitions**
Amandine Rolland¹, Renaud Binet², Arthur Dick², Jean-Louis Raynaud^{2,3}, Laurent Mongin¹, G rard Dedieu⁴, Michel D jus^{2,3}
¹Thales Services, Lab ge, France
²DSO, CNES, Toulouse, France
³DNO, CNES, Toulouse, France
⁴UMR 5126, CESBIO, Toulouse, France
- 12:05 **The VEN S L2A and L3A Surface Reflectance Products**
Camille Desjardins¹, Arthur Dick¹, Olivier Hagolle², Peter Kettig¹, G rard Dedieu²
¹CNES, CNES, France
²CESBIO, CNES, France
- 12:20 **The Effect of Less Than 2 Minutes and Viewpoint on Vegetation INDICES OBTAINED BY VEN S**
Ittai Herrmann¹, Manuel Salvoldi², Arnon Karnieli², Rom Tarshish¹
¹The Robert H. Smith Institute of Plant Sciences and Genetics in Agriculture, Faculty of Agriculture, Food and Environment, Hebrew University of Jerusalem, Rehovot 7610001, Israel
²The Remote Sensing Laboratory, Jacob Blaustein Institutes for Desert Research, Ben-Gurion University of the Negev, Sede Boker 84990, Israel

12:30-13:30 Lunch

Dining Room

13:30-15:00 Session E.1 (3)

Hall A

Chairs: MSO: **Michel Boër**, DO: **Pietro Ubertini**

13:30

CAMELOT: Cubesats Applied for MEasuring and Localising Transients - Mission Overview and In-Orbit Demonstration

Norbert Werner¹, Andras Pal², Masanori Ohno^{1,2}, Jakub Ripa¹, Laszlo Meszaros², Gabor Galgoczi¹, Kazuhiro Nakazawa⁴, Hiromitsu Takahashi³, Kento Torigoe³, Yasushi Fukazawa³, Tsunefumi Mizuno³, Robert Laszlo⁵, Jakub Kapus⁶, Norbert Tarcai⁷

¹MTA-ELTE Lendulet Hot Universe Research Group, Eotvos University, Hungary

²Konkoly Observatory, MTA Research Centre for Astronomy and Earth Sciences, Hungary

³School of Science, Hiroshima University, Japan

⁴Center for Experimental Studies, Nagoya University, Japan

⁵NEEDRONIX LLC, NEEDRONIX LLC, Slovakia

⁶Spacemanic LLC, Spacemanic LLC, Slovakia

⁷C3S LLC, C3S LLC, Hungary

13:45

Infrared Smallsat For Cluster Evolution Astrophysics (ISCEA)

Randall Rose¹, Yun Wang², Jacob McGee¹, Josh Duncan³, Michael Davis¹, Pete Roming¹

¹Division of Space Science and Engineering, Southwest Research Institute, San Antonio, Texas, USA

²Infrared Processing and Analysis Center, Cosmology and Astrophysics, California Institute of Technology, Pasadena, CA, USA

³Department of Systems Engineering, Blue Canyon Technologies, Inc, Boulder, CO, USA

14:00

THESEUS: a candidate ESA M5 space mission

Enrico Bozzo

Astronomy, University of Geneva, Versoix, Ge, Switzerland

14:15

High Performance Near and Far Ultraviolet Camera for Star Planet Activity Research CubeSat (SPARCS)

Shouleh Nikzad¹, April Jewell¹, Christophe Basset¹, Sam Cheng¹, Nikzad Toomarian¹, Gillian Kyne¹, Evgenya Shkolnik²

¹Sensors and Microdevices, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA

²School of Earth and Space Exploration, Arizona State University, Tempe, Az, USA

14:30	<p>GMOD: The Gamma-Ray Module on EIRSAT-1 <u>Joseph Mangan</u>, David Murphy, Alexey Uliyanov, Alexey Ulyanov, Sheila McBreen, Lorraine Hanlon, EIRSAT-1 Team The School of Physics, University College Dublin, Dublin, Leinster, Ireland</p>	
13:30-15:00	<p>Session PRBEM.1 Chairs: MSO: Vincent Maget, DO: Bernard Blake</p>	Hall B
13:30	<p>Radiation Belt Monitoring in the Universat-SOCRAT Multi-Satellite Mission <u>Mikhail Panasyuk</u>, Vladimir Kalegaev, Vladislav Osedlo, Vasily Petrov, Mikhail Podzolko, Ilya Rubinstein, Sergey Svertilov, Vladimir Tulupov Department of Space Sciences, D.V. Skobeltsyn Institute of Nuclear Physics of M.V. Lomonosov Moscow State University (SINP MSU), Moscow, Russia</p>	
13:45	<p>Observations of Bursty Energetic Electron Precipitation using Pairs of Cubesats <u>Bernard Blake</u> Space Science Applications Laboratory, The Aerospace Corporation, Los Angeles, California, USA</p>	
14:00	<p>The Low-Latitude Ionosphere/Thermosphere Enhancements in Density (LLITED) Mission <u>Rebecca Bishop</u>¹, James Clemmons², Aroh Barjatya³, Richard Walterscheid¹ ¹Space Science Department, The Aerospace Corporation, El Segundo, California, United States Minor Outlying Islands ²Physics, University of New Hampshire, Durham, New Hampshire, USA ³Physical Sciences Department, Embry-Riddle Aeronautical University, Daytona Beach, Florida, USA</p>	
14:15	<p>IGOSat – a 3U educational CubeSat for measuring the ionospheric Total Electron Content and characterizing the radiation belts electrons and gamma-ray emission. <u>Philippe Laurent</u>¹, Hana Benhezia³, Hubert Halloin², Pierdavide Coisson⁴ ¹DRF/IRFU/DAP, Commissariat à l’Energie Atomique, France ²Gravitation, Astroparticule and Cosmology, France ³AHE, Astroparticule and Cosmology, France ⁴IPG, Institut de Physique du Globe, France</p>	
14:30	<p>Shields-1 Preliminary Radiation Shielding Dosimetry in Polar Low Earth Orbit <u>D. Laurence Thomsen III</u> Advanced Materials and Processing Branch, NASA Langley Research Center, Hampton, Virginia, USA</p>	

14:45 **The Potential of LEO CubeSats for Science, and Radiation Environment Specification**

Vassilis Angelopoulos, Ethan Tsai, Colin Wilkins, Ryan Caron,
Anton Artemyev, Xiaojia Zhang
Earth, Planetary, and Space Sciences, UCLA, Los Angeles, California, USA

13:30-15:00 Session A.4 (3) Hall C
Chairs: MSO: **G rard Dedieu**, DO: **Arnon Karnieli**, DO: **Jean-Baptiste F ret**

13:30 **Land Monitoring Aspects By Sentinel-2 And VEN S**

Paul Kamoun¹, Tal Feingersh², Shlomi Farchi¹, Noah Dana-Picard¹,
Yotam Warshawski¹, Gamliel Roos¹
¹*Space Laboratory, JCT - Jerusalem College of Technology, Jerusalem, Israel*
²*Space Department, IAI, Yehud, Israel*

13:45 **Land Surface Phenologies of Grasslands: Comparing Ven S Time Series from Naryn, Kyrgyzstan and the Eastern Sandhills of Nebraska, USA**

Geoffrey Henebry¹, Monika Tomaszewska²
¹*Dept of Geography, Environment & Spatial Sciences and the Center for Global Change & Earth Observations, Michigan State University, East Lansing, Michigan, USA*
²*Geospatial Sciences Center of Excellence, South Dakota State University, Brookings, SD, USA*

14:00 **Using UAVs and VEN S to Characterize the Phenology of Mediterranean Woody Species Across Spatial Scales**

Shelly Elbaz¹, Efrat Sheffer², Itamar Lensky³, Noam Levin⁴
¹*Advanced School for Environmental Studies, The Hebrew University of Jerusalem, Israel*
²*Faculty of Agriculture, Food and Environment, The Hebrew University of Jerusalem, Israel*
³*Department of Geography and Environment, Bar-Ilan University, Israel*
⁴*Department of Geography, The Hebrew University of Jerusalem, Israel*

14:15 **Mapping Crop Phenology Using VEN S Observations Over Maryland experimental sites**

Feng Gao¹, Martha Anderson¹, Arnon Karnieli², William Kustas¹,
Craig Daughtry¹
¹*USDA-ARS, Hydrology and Remote Sensing Laboratory, Beltsville, Maryland, USA*
²*Ben-Gurion University of the Negev, Jacob Blaustein Institutes for Desert Research, Israel*

- 14:30 **Assessment of Chickpea Morpho-Physiological Traits by VEN.S All Bands and Vegetatio Indices**
 Ittai Herrmann¹, [Roy Sadeh](#)¹, Asaf Avneri¹, Ran Lati², Shahal Abbo¹, David J. Bonfil³, Zvi Peleg¹
¹The Robert H. Smith Institute of Plant Sciences and Genetics in Agriculture, Faculty of Agriculture, Food and Environment, Hebrew University of Jerusalem, Rehovot 7610001, Israel
²Department of Plant Pathology and Weed Research, Newe Ya'ar Research Center, Agricultural Research Organization, Ramat Yishay 30095, Israel
³The Department of Vegetable and Field Crop Research, The Institute of Plant Sciences Agricultural Research Organization, Gilat Research Center M.P. Negev, 8531100, Israel
- 14:45 **Estimation of Functional and Structural Traits of C3 And C4 Crops Using Venus And in Situ Reflectance Data**
 Elizabeth Walter-Shea¹, Timothy Arkebauer², [Anatoly Gitelson](#)¹
¹School of Natural Resources, University of Nebraska-Lincoln, Lincoln, Nebraska, USA
²Department of Agronomy & Horticulture, University of Nebraska-Lincoln, Lincoln, Nebraska, USA

15:00-15:30 Coffee Break

15:30-16:35 Session E.1 (4) **Hall A**
 Chairs: MSO: **Michel Boër**, DO: **Pietro Ubertini**

- 15:30 **Prospects of the SmallSat Solar Activity/Axion X-ray Imager (SSAXI)**
[Christopher Moore](#), Jae Sub Hong, Almus Kenter, Katharine Reeves, Suzanne Romaine
 High Energy, Harvard-Smithsonian Center for Astrophysics, Cambridge, Massachussetts, USA
- 15:45 **Towards a Network of GRB Detecting Nanosatellites**
[Jeremy Perkins](#)¹, Michelle Hui³, Andras Pal², Judy Racusin¹, Norbert Werner²
¹Astroparticle Physics Laboratory, NASA/GSFC, Greenbelt, MD, USA
²Astrophysics, MTA-Eotvos University, Budapest, Hungary
³Astrophysics, NASA/MSFC, Huntsville, AL, USA

- 16:05 **Ultra wide-field UV transient exploration satellite Hibari**
Yoichi Yatsu¹, Nobuyuki Kawai¹, Shouleh Nikzad³, Shrinivas Kulkarni⁴,
 Nozomu Tominaga⁵, Masaomi Tanaka⁶, Tomoki Morokuma⁷, Naotaka Suzuki⁸,
 Saburo Matunaga², Norihide Takeyama⁹, Akihito Inokuchi⁹
¹Physics, Tokyo Institute of Technology, Meguro, Tokyo, Japan
²Mechanica Engineering, Tokyo Institute of Technology, Meguro, Tokyo,
 Japan
³Micro Device Laboratory, Jet Propulsion Laboratory, Pasadena, California,
 USA
⁴Astronomy, California Institute of Technology, Pasadena, California, USA
⁵Physics, Konan University, Kobe, Hyogo, Japan
⁶Astronomy, Tohoku University, Sendai, Miyagi, Japan
⁷Astronomy, University of Tokyo, Mitaka, Tokyo, Japan
⁸Kali Institute for Physics and Mathematics of the Universe, University of
 Tokyo, Kashiwa, Chiba, Japan
⁹Mitaka Office, Genesis Corporation, Mitaka, Tokyo, Japan

- 16:20 **ULTRASAT's View of The Transient Universe: From Neutron Star
 Mergers to Planet Habitability**
Yossi Shvartzvald, Avishay Gal-Yam, Eran O. Ofek, Ofer Lapid, Eli Waxman
 Physics, Weizmann Inst., Rehovot, Israel

15:30-16:30 **Session PRBEM.1 (2)** **Hall B**
 Chairs: MSO: **Vincent Maget**, DO: **Bernard Blake**

- 15:30 **Constellation of CanSats to explore Van Allen Belts**
Vipul Mani
 Aerospace Engineering, University of Petroleum and Energy Studies,
 Dehradun, Uttarakhand, India

- 15:45 **Insights on Radiation Belt Precipitation and Losses using Low-Altitude
 Measurements in Conjunction with NASA's Radiation Belt Storm Probes**
David Klumpar¹, David M. Klumpar¹, John Glenn Sample¹,
 Harlan A. Spence², Mykhaylo Shumko¹, Arlo Johnson¹
¹Department of Physics, Montana State University, Bozeman, Montana, USA
²Institute for the Study of Earth, Oceans, & Space and Department of
 Physics, University of New Hampshire, Durham, New Hampshire, USA

- 16:00 **ONERA nanosat project ONSAT-1 on radiation belt monitoring and
 effects**
Bruno Christophe, D. Falguère, J-C. Mateo-Velez, S. Bourdarie, V. Maget, J.
 Guérard, F. Issac, ONERA, France .

16:15 **She-Space: A multi-disciplinary educational space project for high school girls**
Shimrit Maman, Sivan Isaacson, Lonia Friedlander, Dan G. Blumberg
Earth and Planetary Image Facility, Ben-Gurion University of the Negev, Israel

15:30-17:00 **Session A.4 (4)** **Hall C**
Chairs: MSO: **G rard Dedieu**, DO: **Arnon Karnieli**, DO: **Jean-Baptiste F ret**

15:30 **Remote Sensing Modeling of Ecosystem Productivity and Evapotranspiration: New Insights from VEN S**
Jiquan Chen¹, Pietro Sciusco¹, Dawei Xu², Michael Abraha¹, Changliang Shao², Cheyenne Lei¹, Gabriela Shirkey¹, Arnon Karnieli⁵, Ranjeet John⁴, Gang Dong³, David Reed¹, Fei Li¹, Geoffrey Henebry¹, Xu Wang², Kyla Dahlin¹, Xiaoping Xin²
¹*CGCEO/Geography, Michigan State University, East Lansing, MICHIGAN, USA*
²*National Hulunber Grassland Ecosystem Observation and Research Station, Chinese Academy of Agricultural Sciences, Beijing, Beijing, China*
³*School of Life Science, Shanxi University, Taiyuan, Shanxi, China*
⁴*Department of Biology, University of South Dakota, Vermillion, SD, USA*
⁵*Jacob Blaustein Institutes for Desert Research, Ben-Gurion University of the Negev Sede-Boker Campus, Negev Sede-Boker, Negev Sede-Boker , Israel*

15:45 **Crop Stages and Biophysical Variables Retrieval Using VEN S Observations**
Taeken Wijmer, G rard Dedieu, Jean-Francois Dejoux,  ric Ceshia, Jean-Louis Roujean
Toulouse University, Unit  mixte CNES-CNRS-IRD-UPS, CESBIO, Toulouse, France

16:00 **Using Venus to Map Daily Evapotranspiration over Irrigated Agricultural in Arizona**
Andrew French¹, Charles Sanchez², Juan Roberto Gonzalez Cena², Mazin Saber²
¹*Water Management and Conservation Research Unit, USDA ARS ALARC, Maricopa, Arizona, USA*
²*Department of Soil, Water, and Environmental Science, University of Arizona, Maricopa, Arizona, USA*

- 16:15 **Impact of Flux Footprint Heterogeneity of Agricultural Site on Surface-Atmosphere Exchange**
 Frantisek Zemek¹, Miroslav Píkl¹, Milan Fischer²
¹Remote Sensing, Global Change Research Institute, The Czech Academy of Sciences, Brno, Czech Republic
²Matters and Energy Fluxes, Global Change Research Institute, The Czech Academy of Sciences, Brno, Czech Republic
- 16:30 **Monitoring Nitrogen Application with VEN μ S in the Northern Negev, Israel**
 Yaron Michael¹, Itamar Lensky¹, David Bonfil²
¹Dept. of Geography & Environment, Bar-Ilan University, Ramat Gan, Israel
²Dept. of Vegetable and Field Crop Research, Research, Agricultural Research Organization, Israel
- 16:45 **Monitoring Inland Waterbody from Multiple Remote Sensing Satellites: A Case Study in Tsengwen Reservoir, Taiwan**
 Kuo-Hsin Tseng^{2,3}, C.K. Shum¹, Wei-Han Ma³, Chung-Yen Kuo⁴, Yuanyuan Jia¹
¹School of Earth Sciences, The Ohio State University, Columbus, Ohio, USA
²Center for Space and Remote Sensing Research, National Central University, Taoyuan, Taiwan
³Dept. Civil Engineering, National Central University, Taoyuan, Taiwan
⁴Dept. Geomatics, National Cheng Kung University, Tainan, Taiwan

FRIDAY, NOVEMBER 8, 2019

A visit at the Satellite & Space laboratory at the Herzliya Science Center where high-school students build nano-satellites and launch them into space.

(As part of the program two satellites were built and launched successfully, Duchifat satellites, and currently another 10 satellites are being built by students from all over the country and will be launched together as a constellation into space.)

Visiting Plan:

- 08:50 -9:45 Presentation by the students about the satellite development program, including scientific and technological challenges.
- 9:45-10:30 Tour at the laboratory and the ground station