

### TUESDAY 30 MAY, 2023

Location	GRC (Galileo Reference Centre)
14.00	European Journal of Navigation (by invitation only)
14.40	<b>Coffee break</b>
15.00	EUGIN (European Group of Institutes of Navigation) Council & General Assembly (by invitation only)
16.00	<b>Tea break</b>
16.30	IAIN (International Association of Institutes of Navigation) Officers' Meeting (by invitation only)
<b>18.00 - 19.30 Ice Breaker Reception</b>	



## WEDNESDAY 31 MAY, 2023

### 10.00 PLENARY - OPENING

### HIGHBAY

10.00 - NIN Welcome - **Bart Banning** / **Merle Snijders**, ENC LOC

10.05 - EUGIN - **Terry Moore**, Chairman

10.10 - Opening Speech - **Mark Harbers**, Dutch Minister of Infrastructure and Water Management

10.25 - ESA ESTEC - **Dietmar Pilz**, Director

10.35 - ESA Navigation - **Javier Benedicto**, Director

10.55 - ESA G2 announcement - **E. Guarino**, **M. Manteiga**, ESA / **T. Sassorossi**, TAS-IT / **S. Sandrone**, ADS-DE / **M. Romay**, GMV / **B. Broudy**, TAS-FR / **P. Jeanne**, TSIX-FR / **J-C Castellanos**, TEC-ES, LEO-IT / **G. Moura**, SAF-FR / ESA G2 PM / Heads of industry



Mark Harbers



Javier Benedicto

11.30

Coffee break

### 12.00 PLENARY - KEYNOTES

### HIGHBAY

12.00 - EUSPA - **Alvaro Mozo**, GNSS Exploitation Service Engineering Manager

12.18 - Spaceopal - **Marco Folino**, CEO

11.30 - GPS status update - **Robert Wray**, Commander of 2nd Space Operations Squadron, US Space Force



Pascal Claudel



Robert Wray

13.00

Lunch

Room:	HIGHBAY	AUDITORIUM	NEWTON 1	NEWTON 2
Session:	1. Interference and Jamming 1	7. Advanced GNSS Techniques	3. Performance Prediction, Monitoring and Assessment 1	5. Multi-Sensor and Augmented PNT 1
	Chair: <b>Jim McDonald</b> Co-chair: <b>Alexandru Budianu</b>	Chair: <b>Tom Willems</b> Co-chair: <b>Noori Bni Lam</b>	Chair: <b>Maarten Uijt de Haag</b> Co-chair: <b>Nityaporn Sirikan</b>	Chair: <b>William Roberts</b> Co-chair: <b>Anna Jensen</b>
14.20	<b>P</b> Jammertest 2022 Jamming and Spoofing Lessons Learned <b>Aiden Morrison</b> Senior Researcher, SINTEF AS	Multibeam GNSS using Phased Array Antenna <b>Lionel Tombakdjian</b> Phd. Student, LEAT CNRS UMR7248	GNSS-Finland: Resilient PNT Monitoring at a National Level <b>Toni Hammarberg</b> Researcher, Finnish Geospatial Research Institute	<b>P</b> Quantum-based Relative Inertial Navigation with Velocity-aided Alignment and Initialization <b>Pieter De Vries</b> Scientist Innovator, TNO
14.40	<b>P</b> Continuous Localization Assisted Collaborative RFI Detection using the COTS GNSS Receivers <b>Naveed Ahmed</b> Researcher, Norwegian University of Science and Technology (NTNU)	Real-time Multi-GNSS Precise Point Positioning with Ambiguity Resolution Based on the BDS-3 Global Short-message Communication <b>Dr. Ziyuan Song</b> China, Shanghai Astronomical Observatory	<b>P</b> Precise Positioning for Mass-Market: Optimal Data Dissemination Demonstrator <b>Delphine Isambert</b> Phd Student Exagone - Telecom SudParis	Resilient Navigation Through a Novel Fusion Approach for Multiple Inertial Measurement Units <b>Marcel Maier</b> PhD Student, Institute of Navigation, University of Stuttgart
15.00	<b>P</b> The Vulnerability of Inland Waterway AIS to GNSS Radio Frequency Interference <b>Jakub Steiner</b> GNSS Specialist, GNSS Centre of Excellence	<b>P</b> Multi-constellation/ Multi-frequency GNSS Signal Degradation due to Foliage <b>Uttama Dutta</b> PhD Student, Chalmers University of Technology	Galileo Receiver Performance Analysis with New I/NAV Improvements Live Data <b>Rui Nunes</b> Gnss Engineer, Deimos Engenharia	QGyro - quantum Sensors for Inertial Navigation <b>Steffen Schön</b> University Professor, Institut Für Erdmessung, Leibniz Universität Hannover
15.20	<b>P</b> Beamforming Techniques For Resilient Navigation With Small Antenna Arrays <b>Lucía Pallarés-Rodríguez</b> Research Intern, Universitat Autònoma de Barcelona	<b>P</b> Galileo Performance Improvements employing Meta-Signals – Robustness Analysis against Payload and Receiver Distortions <b>Florian C. Beck</b> Research Associate, German Aerospace Center (DLR)	Galileo High Accuracy Service (HAS) Performance Assessment <b>Alexandre Ramos</b> Cnes	<b>P</b> IMU and GNSS Postprocessing for High-resolution Strapdown Airborne Gravimetry <b>Dr. Vadim Vyazmin</b> Leading Researcher, Lomonosov Moscow State University

WEDNESDAY 31 MAY - CONTINUED

Room:	HIGHBAY	AUDITORIUM	NEWTON 1	NEWTON 2
15.40	<p><b>P</b> LO and Calibration Signal Distribution in a Multi-Antenna Satellite Navigation Receiver <b>Uwe Stehr</b> <i>Scientific Assistant, TU Ilmenau</i></p>	<p><b>P</b> Quad-band Multi-constellation GNSS Receiver Development Platform with System-on-Chip Architecture <b>Muhammad Saad</b> <i>Senior Engineer, Fraunhofer IIS Nürnberg</i></p>		<p>LiDAR-inertial Odometry Quality Control Method Based on Reliability Theory <b>Dr. Guoliang Liu</b> <i>Nanjing, P.R.China, Southeast University</i></p>
14.30 <b>ESTEC Test Centre Tour 1 at 14.30 - 15.30.</b> Meeting point: Registration desk (pre-registration required)				
16.00 <b>Tea break</b>				
Session:	1. Interference and Jamming 2	3. Performance Prediction, Monitoring and Assessment 3	3. Performance Prediction, Monitoring and Assessment 2	5. Multi-Sensor and Augmented PNT 2
	<p>Chair: <b>Barend Lubbers</b> Co-chair: <b>Ruediger Matthias Weiler</b></p>	<p>Chair: <b>Stephan Procee</b> Co-chair: <b>Elizabeth Laier English</b></p>	<p>Chair: <b>Dana Goward</b> Co-chair: <b>Olivier Raphael Smeyers</b></p>	<p>Chair: <b>Alain Geiger</b> Co-chair: <b>Carlos Jahn</b></p>
16.30	<p><b>P</b> Interference Detection, Localization and Mitigation Capabilities of Controlled Reception Pattern Antenna for Aviation <b>Annemarie Van Zwol</b> <i>R&amp;D Engineer, Netherlands Aerospace Centre</i></p>	<p><b>P</b> A Comparative Experimental Performance Assessment of RTK+OSNMA Based Positioning for Road Vehicle Applications <b>Dr. Susanne Schweitzer</b> <i>Scientist, Joanneum Research Forschungsgesellschaft mbH</i></p>	<p><b>P</b> EGNOS Performance Prediction <b>Dr. Pieter Bastiaan Ober</b> <i>Senior Navigation Engineer, INTEGRICOM</i></p>	<p><b>P</b> Experimentation of Vision-aided Inertial Navigation System (VaINS) on a Small Fixed-wing UAV <b>Baheerathan Sivalingam</b> <i>Senior Researcher, Norwegian Defence Research Establishment (ffi)</i></p>
16.50	<p><b>P</b> GNSS Radio Frequency Interference mitigation in Collins Commercial Airborne Receivers <b>Patrick Bartolone</b> <i>Sr System Engineer, Collins Aerospace</i></p>	<p><b>P</b> Reliability of Smartphone Positioning in Harsh Environment <b>Prof. Salvatore Gaglione</b> <i>Full Professor, University of Naples "Parthenope"</i></p>	<p>EGNOS Service Provision &amp; Evolutions <b>José Manuel Alvarez López</b> <i>Service Development Manager, European Satellites Services Provider (ESSP-SAS)</i></p>	<p><b>P</b> Local Differential GNSS Augmentation for Integration into Urban Air Mobility <b>Daniel Gerbeth</b> <i>Researcher, German Aerospace Center (DLR)</i></p>
17.10	<p><b>P</b> GNSS Interference Monitoring and Detection (GIMAD) System <b>Enric Obiols Bernaus</b> <i>Technical Manager, Indra Sistemas S.a.</i></p>	<p>Worldwide SBAS Broadcast Between 2017 and 2023: a Comparative Study <b>Alessandra Calabrese</b> <i>Gmv Aerospace And Defence S.a.u.</i></p>	<p>Evaluation of Galileo High Accuracy Service (HAS) with real-world Android smartphone navigation dataset <b>Dr. Frank van Diggelen</b> <i>Distinguished Engineer, Google</i></p>	<p>Multibeam GNSS Antenna Based on Flatten Luneburg Lens <b>Prof. Fabien Ferrero</b> <i>Professor, UCA</i></p>
17.30   17.50		<p><b>P</b> Advanced Receiver Autonomous Integrity Monitoring (ARAIM) for Unmanned Aerial Vehicles <b>Heiko Engwerda</b> <i>Royal Netherlands Aerospace Centre</i></p>	<p><b>P</b> On the Performance of Direct Position Estimation for VDES R-Mode <b>Markus Wirsing</b> <i>Researcher, German Aerospace Center (DLR)</i></p>	<p><b>P</b> Cooperative Swarm Geometry Optimization for Assured Navigation with Range Radios in GNSS Denied Environments <b>Mats Martens</b> <i>Scientific Assistant, TU Berlin</i></p>

19.00 - 23.30  
Beach Dinner





## Thursday 1 June, 2023

09.00		PLENARY - Lunar Navigation and Exploration: a New Paradigm					HIGHBAY	
 09.50		Opening - Chair: <i>Edward Breeuwer, ESA</i> Lunar Navigation and Moonlight Programme Overview - <i>Javier Ventura, ESA</i> Lunar Pathfinder Navigation Experiment - <i>Pietro Giordano, ESA</i> Q&A					  <i>Edward Breeuwer</i> <i>Javier Ventura</i>	
Room:	HIGHBAY	AUDITORIUM	NEWTON 1	NEWTON 2	EINSTEIN			
Session:	17. Space Navigation	8. Integrity Algorithms	4. Alternative and Complementary PNT 1	11. Use of AI and Machine Learning 1	1. Interference and Jamming 3			
	Chair: <i>Terry Moore</i> Co-chair: <i>Pietro Giordano</i>	Chair: <i>Bas Ober</i> Co-chair: <i>Sandra Verhagen</i>	Chair: <i>Hein Zelle</i> Co-chair: <i>Salvatore Gaglione</i>	Chair: <i>Axel van den Berg</i> Co-chair: <i>John Pottle</i>	Chair: <i>Barend Lubbers</i> Co-chair: <i>Ruediger Matthias Weiler</i>			
10.00	Benefits for Space Geodesy from the Galileo System <i>Prof. Dr. Krzysztof Sośnica</i> Professor, Institute of Geodesy And Geoinformatics, Wrocław University of Environmental And Life Sciences	 Integrity Algorithms for Galileo Timing Receivers <i>Dr. Ciro Gioia</i> External Consultant at the Joint Research Centre, Independent Researcher	Performance Assessments of a Low-RF Navigation System for Emergencies and Harsh Environments <i>Alejandro Pérez Conesa</i> Project Manager, GMV	ProNet: A Hybrid Adaptive Navigation Filter <i>Nadav Cohen</i> Phd Student, University of Haifa	 Robustness Levels of Critical Infrastructures Against GNSS Global Navigation Satellite System Signal Disturbances <i>Andre Bos</i> Founder, S[&]T			
10.20	Simulation and Analysis of the Precise Orbit Determination for the High-orbit Satellite using Kal/GNSS Observations <i>Dr. Kecai Jiang</i> Postdoctoral fellow, Wuhan University	 Preliminary Assessment of Integrity Parameter Performance for Nation-Wide PPP-RTK Service in South Korea <i>Jaeyoung Song</i> Researcher, Maritime PNT Research Office, KRISO	National Sovereignty and Resilient PNT <i>Dana Goward</i> President, Resilient Navigation and Timing Foundation	Leveraging Artificial Intelligence for Algorithm Design and Trial to Enhance Raw Measurements <i>Oliver Towlson</i> Gmv Nsl Limited	Integral System for Jamming and Spoofing Events Classification and Location to ensure Safe PNB Operations <i>Isaac Ballesteros</i> CTO, Centum Research & Technology			
10.40	Analysis of OD&TS using ISL for MARCONI Constellation around Mars Including user Positioning Performance <i>Serena Molli</i> Phd Student, University La Sapienza Of Rome	Navigation and Orbit Determination for a Geostationary Satellite using Onboard GPS and BDS Observations <i>Dr. Wenwen Li</i> Post Doctor, Wuhan University		 Antiference: New Concept for Evolutive Mitigation of RFI to GNSS <i>Shahzad Afroozeh</i> Senior Researcher, OHB Digital Solutions	GNSS RFI Geolocation using Real-world Data from Android Smartphones <i>Søren Skaarup Larsen</i> Ph.d. Student Technical University of Denmark			
10.15	ESTEC Test Centre Tour 2 at 10.15 - 11.15. Meeting point: Registration desk (pre-registration required)							
11.00	Coffee break							
POSTER SESSION at Newton Foyer								
Session:	18. Moon/Mars Navigation Services	10. High Accuracy Techniques 1	4. Alternative and Complementary PNT 2	11. Use of AI and Machine Learning 2	1. Interference and Jamming 4			
	Chair: <i>Frank van Diggelen</i> Co-chair: <i>Terry Moore</i>	Chair: <i>Maarten Uijt de Haag</i> Co-chair: <i>Irma Rodriguez</i>	Chair: <i>Dana Goward</i> Co-chair: <i>William Roberts</i>	Chair: <i>Paolo Crosta</i> Co-chair: <i>Anna Jensen</i>	Chair: <i>Jim McDonald</i> Co-chair: <i>Alexandru Budianu</i>			
11.30	Cooperative Positioning-GNSS applied to the NaviMoon High-sensitivity Lunar Receiver <i>Anais Delépaut</i> PhD Student, Politecnico Di Torino	 AI-Driven GNSS Carrier Phase Ambiguity Resolution: A Conceptual Approach <i>Amarildo Haxhi</i> Phd, National Technical University of Athens	 Radar Absolute Positioning <i>Lydia Hyde</i> Principal Engineer, GRAD (GLA UK & Ireland)	 Satellite Navigation Signal Interference Detection and Machine Learning-Based Classification Techniques towards Product Implementation <i>Jelle Rijnsdorp</i> S[&]T	 Performance Characterization of NovAtel's Robust Dual-Antenna Receiver (RoDAR) during the Norwegian Jamming Trial 2022 <i>Ali Broumandan</i> Resilient GNSS Lead, NovAtel			

THURSDAY 1 JUNE - CONTINUED

Room:	HIGHBAY	AUDITORIUM	NEWTON 1	NEWTON 2	EINSTEIN
11.50	Navigation Performance of a Lunar Surface Rover Using LCNS Positioning Assuming Realistic ODTS Performances <b>Yoann Audet</b> Young Graduate Trainee, European Space Agency	PATHfinder. PNT as A Technology to support a scalable Fleet of IINKed Drones operating in BVLOS scenarios for preventive monitoring and Emergency missions <b>Marco Nisi</b> Head Of Integrated Space Solutions, Sistematica S.p.A.	AoA-based Coarse Positioning for GNSS Applications <b>Dr. Noori Bni Lam</b> Research Fellow, ESA	Flight Tested Results and Performance Analysis of a Machine-Learning Software-enhanced Inertial Navigation System <b>Dr. Carl Sequeira</b> Head of Engineering, Flare Bright	Aviation resilience to GNSS frequency jamming and cyber threats (AIRING) <b>Luis Javier Álvarez Antón</b> Gmv
12.10	Examining Galileo E6 HAS in Space Environment Using N-SPHERE Syrlinks Receiver and Orolia GNSS Simulator <b>Benoit Legru</b> Software Navigation Engineer, Syrlinks	Estimating Satellite Navigation Broadcast Ephemeris via Inter-Satellite and Ground-to-Satellite Ranging <b>Manuele Walter Josef Dassié</b> Scientific Researcher, German Aerospace Center (DLR)	Orbits-as-a-Service for Signals of Opportunity based Position, Navigation and Timing (PNT) <b>Dr. Luis Enrique Aguado Bayon</b> Section Head, PNTUK GMV	Accurate Orbit Corrections for Single-frequency GNSS Receiver with Transformer Deep Learning <b>Alejandro Pérez Conesa</b> Project Manager, GMV	
12.30	Lunar Navigation System ODTS Signal In Space Error Analysis <b>Martina Cappa</b> Time and Frequency Engineer Thales Alenia Space Italia	Cycle slip Detection of Single-frequency Measurement in Drone Platform <b>Chan-hee Lee</b> Master's Course, Hongik University			

11.30 **ESTEC Test Centre Tour 3 at 11.30 - 12.30.** Meeting point: Registration desk (pre-registration required)

12.50

Lunch

13.00 - 13.20  
Lunch Session

**U.S. President's National Space-based PNT Advisory Board (room: Highbay)**  
*Dana Goward, Resilient Navigation and Timing Foundation*  
*Frank v Diggelen, Google*  
*Terry Moore, Royal Institute of Navigation*



Dana Goward Frank van Diggelen




Session:	15. Reference Trajectory Optimization 1	10. High Accuracy Techniques 2	4. Alternative and Complementary PNT 3	19. Simulation, Testing, Analysis Tools and Results	2. Spoofing and Meaconing 1
	Chair: <b>Axel van den Berg</b> Co-chair: <b>Frank van Diggelen</b>	Chair: <b>Valérie Renaudin</b> Co-chair: <b>Anna Jensen</b>	Chair: <b>Sherman Lo</b> Co-chair: <b>Rafael Lucas Rodriguez</b>	Chair: <b>Sandy Kennedy</b> Co-chair: <b>Nityaporn Sirikan</b>	Chair: <b>Jim McDonald</b> Co-chair: <b>Alexandru Budianu</b>
14.20	The Galileo Return Link Service for Space Debris Collision Avoidance <b>Jesus Cegarra</b> Head Of Division, Gmvdad	LAMBDA 4.0: an Enhanced Toolbox for high Dimensional Ambiguity Resolution <b>Lotfi Massarweh</b> Gnss Researcher, Delft University of Technology	Effect of Carrier Frequency Offset on Range Estimation Performance in VDES R-Mode Receiver <b>Jang Hwan Shin</b> South Korea, Chungnam National University	Hardware in the Loop Laboratory Test Systems for Medium Frequency R-Mode Receivers <b>Lars Grundhöfer</b> Phd Student, German Aerospace Center	PASSport Project. An OSNMA enabled GNSS receiver to Support Port Operations with Drones <b>Dr. Marco Nisi</b> Head of Integrated Space Solutions, Sistematica S.p.A.
14.40	Safety Critical Optimization of IFR - Low Level Trajectories in Alpine Areas <b>Alain Geiger</b> Prof. Em., ETH	Assessing the Galileo High Accuracy Service at High Latitudes <b>Jihye Park</b> Oregon State University	Classical Positioning with Modern Optical Sensors <b>Anton Scheele</b> Assistant Professor, Netherlands Defence Academy	Behaviour of COTS Receiver under Simulated Multi-Frequency GNSS Induced Spoofing <b>Sowmyashree Lakshmaiah</b> GNSS Engineer, Work Microwave GmbH	Feasibility of Snapshot OSNMA for Spoofing Detection in Urban Scenarios <b>Husnain Shahid</b> Universitat Autònoma de Barcelona

THURSDAY 1 JUNE - CONTINUED

Room:	HIGHBAY	AUDITORIUM	NEWTON 1	NEWTON 2	EINSTEIN
15.00	<p>WASP1 Route Optimization using Short Span High Accuracy Weather Forecast <b>Stephan Procee</b> Sr. Lecturer, Maritiem Instituut Willem Barentsz</p>	<p>Interval Bounding Analysis for Precise Point Positioning <b>Rui Wang</b> Research Associate, Institute of Navigation, University of Stuttgart</p>	<p>Development of a Software-Defined-Radio-based Real-Time Maritime Positioning System <b>Nhat Minh Hoang</b> Research Engineer, Covadonga GmbH</p>	<p>Performance Improvement of GNSS Foresight in Deep Urban Environments <b>Raphael Grech</b> Technical Strategist Spirent Communications</p>	<p>E1-E6 SDR Platform Based on BladeRF for testing Galileo Assisted Commercial Authentication Service <b>Rafael Terris-Gallego</b> Researcher, Univ Autonoma de Barcelona (UAB)</p>
15.20	<p>Urban Route Planning Based on Network-RTK Positioning Integrity Prediction <b>Ali Karimidoona</b> Ph.d. candidate, Leibniz University Hannover</p>	<p>Achieving Sub-decimetre Accuracy with the Galileo High Accuracy Service: Results from GMV's HAS Positioning Engine <b>Jorge Duran Zafrilla</b> GMV</p>	<p>Integration of GNSS and 5G for Precise Positioning <b>Marianna Alghisi</b> Phd Student, Politecnico Di Milano</p>	<p>Realism-oriented Design, Verification and Validation of Novel Robust Navigation Solutions <b>Dr. Ivan Petrunin</b> Senior Lecturer, Cranfield</p>	<p>Tests of Galileo OSNMA for Protection Against GNSS Time Spoofing Attacks <b>Dr. Harald Hauglin</b> Chief Engineer, Justervesenet - Norwegian Metrology Serviceee</p>
15.40	<p>Predicting offshore workability for platform supply vessels using IoT and machine learning <b>Reinier Dick</b> Fleet Manager Offshore Supply Vessels, Peterson Den Helder B.V.</p>	<p>A new Real-time PPP-RTK Positioning Service for Germany <b>Franziska Riedel</b> Scientific Employee, Federal Agency for Cartography and Geodesy (BKG)</p>	<p>Positioning System Based on GSM Signals of Opportunity for Aerial Applications for GNSS Denied Areas <b>María Dolores Tristán del Barrio</b> Hardware Engineer, Skylife Engineering SI</p>		<p>S-TrackS: a Secure Snapshot-Based Solution for Positioning and Timing <b>Thomas Daniel Van Den Oever</b> Gnss Engineer Cgi</p>
14.30	ESTEC Test Centre Tour 4 at 14.30 - 15.30. Meeting point: Registration desk (pre-registration required)				
16.00	Tea break				
16.30	ESTEC Test Centre Tour 5 at 16.30 - 17.30. Meeting point: Registration desk (pre-registration required)				
Session:	15. Reference Trajectory Optimization 2	10. High Accuracy Techniques 3	4. Alternative and Complementary PNT 4	16. End-to-End navigation systems 1	2. Spoofing and Meaconing 2
	<p>Chair: <b>Frank van Diggelen</b> Co-chair: <b>Sandy Kennedy</b></p>	<p>Chair: <b>Christian Tiberius</b> Co-chair: <b>Paolo Crosta</b></p>	<p>Chair: <b>Hans Visser</b> Co-chair: <b>Rafael Lucas Rodriguez</b></p>	<p>Chair: <b>Okko Bleeker</b> Co-chair: <b>Erik Frank Van Der Wenden</b></p>	<p>Chair: <b>Barend Lubbers</b> Co-chair: <b>Elizabeth Laier English</b></p>
16.30	<p>Ice Navigation in Arctic Offshore Wind Parks: Traffic Coordination using Route Exchange and Moving Havens <b>Prof. Thomas Porathe</b> Professor of Interaction Design, NTNU, Norwegian University of Science And Technology</p>	<p>Performance Analysis of Maritime PPP-RTK Service in Korea <b>TaeHyeong Jeon</b> Researcher, Maritime PNT Research Office, KRISO</p>	<p>Preliminary Field Results of a Dedicated 5G Positioning Network for Enhanced Hybrid Positioning <b>Dr. José A. Del Peral Rosado</b> Senior R&amp;D Navigation Engineer, Airbus Defence and Space</p>	<p>Required Navigation Performances for Drone Flight Operations <b>Giovanni Lucchi Cristofaro</b> Mdi Officer EUSPA</p>	<p>Assessing the Resilience of GNSS COTS Receivers Against Sophisticated Spoofing Attacks by the SQM Methods <b>Dr. Amir Tabatabaei</b> CTO, IGASPIN GmbH</p>
16.50	<p>Risk-based UAV Flight Path Optimization in Accordance with SORA <b>Jannik Heinze</b> Student, Technische Universität Berlin</p>	<p>Breaking the One-meter Accuracy Level with Smartphone GNSS Data <b>Marcus Franz Glaner</b> University Assistant, TU Wien - Higher Geodesy</p>	<p>Performance Evaluation of Terrain-Aided Navigation for Helicopters <b>Milos Vesely</b> Honeywell International</p>	<p>High Accuracy Performance Based Navigation Aircraft Approach Paths Combined with Precision Final based on GNSS <b>Thomas Dautermann</b> Dlr</p>	<p>GNSS Threat Scene: Four Years since STRIKE3 Success <b>Mark Dumville</b> Gmv</p>



## THURSDAY 1 JUNE - CONTINUED

Room:	HIGHBAY	AUDITORIUM	NEWTON 1	NEWTON 2	EINSTEIN
17.10	 Automated Route Planning from LiDAR Point Clouds for Agricultural Applications <b>Dipl.-Ing. Fabian Theurl</b> University Research Assistant, Graz University Of Technology	A Satellite-datum-based PPP-RTK Model for All-in-view GNSS Networks <b>Dr. Pengyu Hou</b> PhD Student, Innovation Academy for Precision Measurement Science and Technology, Chinese Academy of Sciences	5G Positioning: Preliminary Analysis of Early Data Sets <b>Chiara Pileggi</b> Politecnico Di Milano	Towards Less Fuel Consumption utilizing Semi-autonomous Operations of the Vessels <b>Ghazaleh Kia</b> R&D Project Manager, Seafar	Collaborative Processing of Distributed Receivers of Opportunity <b>Dr. Shishir Priyadarshi</b> Machine Learning Engineer, GMV, Uk
17.30   17.50	 Concept of a Human-machine Interface for Visualizing Route Progress <b>Robbert Vis</b> Chief Officer Stena Line	Living on the Edge of High Precision PNT Resilience and Security <b>Gustavo Lopez</b> Market Access Manager, Septentrio	A Hybrid Optical-wireless Network for dDecimeter-level Terrestrial Positioning <b>Dr. Jeroen Koelemeij</b> Assistant professor, Vrije Universiteit Amsterdam	 Smart Port Shuttle: Sensor-based Navigation for Inland Waterway Transportation <b>Katrin Dietmayer</b> Senior Engineer, Fraunhofer Institute for Integrated Circuits IIS	

18.00 - 21.30

## Canal Cruise Amsterdam

Meeting point: Bus stop outside ESTEC  
 (Pre-registration required)




## Friday 2 June, 2023

09.00		PLENARY - LOW EARTH ORBIT PNT PANEL		HIGHBAY	
09.00	Opening - Chair: <b>Sandra Verhagen</b> , TU Delft				
09.50	LEO PNT Introduction - <b>Peter Teunissen</b> , TU Delft				
	Future NAV LEO PNT in-orbit demonstration program - <b>Roberto Prieto</b> , TU Delft				
	PULSAR LEO PNT GNSS augmentations - <b>Bryan Chan</b> , XONA				
	Panel discussion: <b>Guenter Heinrichs</b> , Spirent / <b>Patrick Shannon</b> , Trustpoint / <b>Jim McDonald</b> , Honeywell / <b>Patrick Bartelone</b> , Collins Aerospace				
				Sandra Verhagen Roberto Prieto	
Room:	HIGHBAY	AUDITORIUM	NEWTON 1	NEWTON 2	
Session:	13. LEO-GNSS Synergism	10. High Accuracy Techniques 4	4. Alternative and Complementary PNT 5	16. End-to-End Navigation Systems 2	
	Chair: <b>Sandra Verhagen</b> Co-chair: <b>Noori Bni Lam</b>	Chair: <b>Axel van den Berg</b> Co-chair: <b>Irma Rodriguez</b>	Chair: <b>Hans Visser</b> Co-chair: <b>Olivier Raphael Smeyers</b>	Chair: <b>Alain Geiger</b> Co-chair: <b>Rafael Lucas Rodriguez</b>	
10.00	<b>P</b> Exploring the contribution of PNT LEO Satellites to Precise Positioning Applications <b>Jorge Duran Zafrilla</b> GMV	Prototype Implementation of Gridded VRS Service based on SSR Messages <b>Dr. Kwan-Dong Park</b> Professor, Inha University	Airspace Surveillance with Unsynchronized low-cost ADS-B Receivers using Time Difference of Arrival Observations <b>Clemens Sonnleitner</b> Research Associate, University of Stuttgart - Institute of Navigation	Secure GNSS and the Role with Autopilot Control Systems <b>Gustavo Lopez</b> Market Access Manager, Septentrio	
10.20	<b>P</b> Analysis of Multipath Code-range Errors in Ruture LEO-PNT Systems <b>Sibren De Bast</b> Septentrio Nv	<b>P</b> Testing the Galileo HAS with the Galileo High Accuracy Reference Algorithm and User Terminal <b>Emilio González</b> Galileo User Services Coordinator, Spaceopal	LEO-based PNT Augmentation <b>Dr. Jaz Hill-Valler</b> Systems Engineer, Satellite Applications Catapult	True North Reference System for Aviation by Eliminating Magnetic Conversion by 2030 <b>Anthony MacKay</b> Vice President And Chief Safety And Quality Officer, Nav Canada	
10.40		Norsat-TD: First in-orbit Demonstration of Real-time Precise Point Positioning using GPS and Galileo <b>Dr. Javier Tegedor</b> Product Owner, Fugro Norway As	Centimetres and Picoseconds without Satellites or Atomic Clocks- Independent EU Test Results of Locata Alt-PNT <b>Nunzio Gambale</b> Ceo, Locata Corporation Pty Ltd	<b>P</b> Resilliance in the Maritime Transport for the Next Decade <b>Stephan Procee</b> Sr. Lecturer, Maritiem Instituut Willem Barentsz	
11.00 Coffee break					
11.30 ESTEC Test Centre Tour 6 at 11.30 - 12.30. Meeting point: Registration desk (pre-registration required)					
Session	14. LEO user Equipment Considerations	10. High Accuracy Techniques 5	9. Atmospheric Modelling and Sensing	16. End-to-End Navigation Systems 3	
	Chair: <b>Tom Willems</b> Co-chair: <b>Ruediger Matthias Weiler</b>	Chair: <b>Hein Zelle</b> Co-chair: <b>William Roberts</b>	Chair: <b>John Pottle</b> Co-chair: <b>Terry Moore</b>	Chair: <b>Stephan Procee</b> Co-chair: <b>Okko Bleeker</b>	
11.30	<b>P</b> Analysis on Baseband Algorithms for LEO PNT <b>Dr. Fran Fabra</b> GNSS Engineer, IEEC-UAB	Global Assessment of Galileo HAS and Ambiguity-fixed Precise Point Positioning using Fugro Reference Station Network <b>Dr. Javier Tegedor</b> Product Owner, Fugro Norway As	<b>P</b> Comparison of Interpolation Methods for Ionospheric Slant TEC from Maritime PPP-RTK Service in Korea <b>Gimin Kim</b> Researcher, Maritime PNT Research Office	Coordinated Path Planning and Control Law Architecture Design Considering Navigation Performance and Resilience <b>Reiko Mueller</b> Researcher, German Aerospace Center (DLR)	
11.50	Coordinating International LEO PNT Productively <b>Dr. Patrick Diamond</b> Ceo, Leopnt Llc	<b>P</b> The Galileo High Accuracy Service: Quality Evaluation of the Corrections and Initial PPP Performance <b>Camille Parra</b> Phd Student, Technische Universität München	<b>P</b> Comparison of NeQuick-G and Klobuchar Model Performances at Single Frequency User Level <b>Ulrich Ngayap</b> Service Performance Engineer, Euspa	Future Role of the Human in Resilient Maritime Navigation <b>Hugo Ammerlaan</b> Head Of Maritime Operations, MARIN	



## FRIDAY 2 JUNE - CONTINUED

Room:	HIGHBAY	AUDITORIUM	NEWTON 1	NEWTON 2	
12.10	<p><b>P</b> Performance Analysis of the Pilot- and Data-Component of a CSS Signal for LEO-PNT  <b>Daniel Egea-roca</b>            Postdoctoral Researcher, Universitat Autònoma De Barcelona (uab)</p>	<p><b>P</b> Multipath Mitigation and NLOS Rejection with Supercorrelation on FocalPoint's Rreal-time Development Platform  <b>Javier Gonzalo Garcia Perez</b>            Principal Gnss Engineer, Focalpoint</p>	<p>Characterization of the ML Ionosphere model's Extrapolation Performance using "Date to Forecast"  <b>Dr. Shishir Priyadarshi</b>            Machine Learning Engineer, GMV, Uk</p>	<p>Where do we go now? Presenting a Model for Human Navigation in Automated Vehicles  <b>Chloe Jackson</b>            PhD Candidate, University of Nottingham</p>	
12.30   12.50	<p>Performance Analyses of User Equipment Technologies and Techniques for LEO-PNT  <b>Dr. Thomas Janssen</b>            Postdoctoral Researcher, imec</p>		<p>GNSS Monitoring and Grabbing Station Based on Software-Defined Radio and Docker Containers  <b>Iman Ebrahimi Mehr</b>            Ph.d Student, Politecnico Di Torino</p>	<p><b>P</b> DEGREE (DronEborne Galileo RecEivEr), Development of a GNSS Receiver for Specific Category UASs Operations  <b>Sergi Dueñas Pedrosa</b>            Gnss Engineer, Qascom</p>	
13.00	<b>PLENARY - CLOSING SESSION</b>			<b>HIGHBAY</b>	
	<p>13:00 - Next Big Thing - <b>Maarten Uijt de Haag</b>, TUBerlin            13:20 - Award ceremony - <b>Okko Bleeker / Valerie Renaudin</b>, TEC            13:25 - IAIN announcements - <b>Zhang Baochen / Kristof Czaplewski</b>, Chairman            13:35 - EUGIN announcements <b>Terry Moore</b>, Chairman / <b>Janusz Uriasz</b>, Chairman            13:50 - NIN farewell - <b>Bart Banning / Merle Snijders</b>, LOC</p>			 <b>Maarten Uijt de Haag</b>	 <b>Terry Moore</b>
13.50   14.50	<b>Lunch</b>				

## Posters

Thursday 1 June, 11.00 - Poster Session at Newton Foyer

**P** An Approach to Cooperative Azimuth Estimation using Multiple Distributed Position Receivers  
**Marvin Banse**  
 Scientific Assistant, Carl Von Ossietzky Universität Oldenburg

Resilient 3D Position and Navigation using Terrestrial Beacons and Cellular Signals  
**Rabih Chrabieh**  
 VP Engineering, NextNav, LLC

Effect of Sounding Rocket Attitude in GNSS Carrier Phase Tracking  
**Iñigo Cortés**  
 Senior Scientist, Fraunhofer IIS

Over-the-air Jamming and Spoofing Tests of GNSS Timing Devices  
**Dr. Harald Hauglin**  
 Chief Engineer, Justervesenet - Norwegian Metrology Serviceeee

Performance of Real-time PPP Time Transfer between UTC(k) Time Scales  
**Dr. Harald Hauglin**  
 Chief Engineer, Justervesenet - Norwegian Metrology Serviceeee

What Users may want: Eetermining Navigation-Specific User Requirements for Drivers in Automated Vehicles  
**Chloe Jackson**  
 PhD Candidate, University of Nottingham

**P** Complementary Corrections of the Ionospheric Model For Spaceborne GPS Receiver  
**Eun-hyouek Kim**  
 Senior Researcher, Satrec Initiative

**P** Design of a Signaling Scheme for Three Equal-power Signals in a New Navigation Satellite System  
**Hyoungsoo Lim**  
 Principal Researcher, Electronics And Telecommunications Research Institute

Statistical Tests of Some Binary Chaotic and Pseudorandom Sequences  
**Prof. Hong-Yeop Song**  
 Professor, Yonsei University

Receiver Clock Characteristics and Modeling in the Multi-GNSS Precise Point Positioning Solutions  
**Prof. Dr. Krzysztof Sośnica**  
 Professor, Institute Of Geodesy And Geoinformatics, Wrocław University Of Environmental And Life Sciences

**P** On the Quantification of the GNSS Signals' Quality for Radiofrequency Interference (RFI) Detection  
**Naveed Ahmed**  
 Researcher, Norwegian University of Science and Technology (NTNU)

**P** Addressing the Potential of L5/E5a Signals for Road ITS Applications in GNSS-harsh Environments  
**Amarildo Haxhi**  
 Phd, National Technical University of Athens

## INTERNET ACCESS

Wi-Fi is available at the venue. Connect to the "esa-public" Wi-Fi; you will be automatically taken to the browser where you can provide your login details. You will find your Wi-Fi login details at the back of your badge. The login details are valid for 3 days.

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## TRANSPORT ON CONFERENCE DAYS

A shuttle service is available on conference days from the NH Leeuwenhorst Hotel, the Two Brothers Noordwijk Beach Hotel and Leiden Central Station to ESA ESTEC and return.

Please see the shuttle service times below.

Transport is offered on a first come first served basis.

### Shuttle Service Times

#### 30 May 2023

##### To Galileo Reference Centre (GRC) from:

17.45 NH Leeuwenhorst – 17.55 Two Brothers Noordwijk Hotel (50 pax)

17.40 Leiden Central Station (50 pax)

Pick-up location in Leiden: Stationsplein 107,  
 2312 AJ (Morssingel/Schipholweg)

##### Return, from Galileo Reference Centre (GRC) to:

19.30 Two Brothers Noordwijk Hotel - 19.40 NH Leeuwenhorst (50 pax)

19.30 Leiden Central Station (50 pax)



Pick-up and drop off location at Leiden Central Station on 31 May, 1 June and 2 June: bus station outside the train station (see map). At the bus stop for the Soldaat van Oranje shuttle, there is sign indicating this stop.

Other pick up location:

- Noordwijkerhout: outside the Hotel NH Noordwijk Conference Centre Leeuwenhorst
- Noordwijk: outside the Two Brothers Noordwijk Beach Hotel
- ESTEC: public bus stop just outside ESTEC

### 31 May 2023

#### To ESTEC from:

08.15 NH Leeuwenhorst – 8.25 Two Brothers Noordwijk Hotel (50 pax)  
08.30 NH Leeuwenhorst – 8.40 Two Brothers Noordwijk Hotel (50 pax)  
08.45 NH Leeuwenhorst – 8.55 Two Brothers Noordwijk Hotel (50 pax)

08.15 Leiden Central Station (50 pax)  
08.30 Leiden Central Station (50 pax)  
08.45 Leiden Central Station (50 pax)

#### Return from ESTEC to:

17.45 Two Brothers Noordwijk Hotel – NH Leeuwenhorst (50 pax)  
18.00 Two Brothers Noordwijk Hotel – NH Leeuwenhorst (50 pax)  
18.00 Two Brothers Noordwijk Hotel – NH Leeuwenhorst (50 pax)

17.45 Leiden Central Station (50 pax)  
18.00 Leiden Central Station (50 pax)  
18.00 Leiden Central Station (50 pax)

#### Beach dinner, to Tulum Beachvilla Noordwijk from:

19.00 Leiden Central Station – 19.20 NH Leeuwenhorst (60 pax)  
19.15 Leiden Central Station – 19.35 NH Leeuwenhorst (120 pax)

#### Return from Tulum Beachvilla Noordwijk to:

22.30 NH Leeuwenhorst – Leiden Central Station (60 pax)  
23.00 NH Leeuwenhorst – Leiden Central Station (60 pax)  
23.40 NH Leeuwenhorst – Leiden Central Station (60 pax)

### 1 June 2023

#### To ESTEC from:

08.00 NH Leeuwenhorst – 8.10 Two Brothers Noordwijk Hotel (50 pax)  
08.15 NH Leeuwenhorst – 8.25 Two Brothers Noordwijk Hotel (50 pax)

08.00 Leiden Central Station (50 pax)  
08.15 Leiden Central Station (50 pax)

#### Return from ESTEC to:

17.45 Two Brothers Noordwijk Hotel – NH Leeuwenhorst (50 pax)  
18.00 Two Brothers Noordwijk Hotel – NH Leeuwenhorst (50 pax)

17.45 Leiden Central Station (50 pax)  
18.00 Leiden Central Station (50 pax)

#### Amsterdam Canal Cruise (for participants pre-registered for the cruise only)

18.00 from Estec > to Amsterdam  
21.30 from Amsterdam > to Leiden Central Station – NH Leeuwenhorst – Two Brothers Noordwijk Hotel

### 2 June 2023

#### To ESTEC from:

08.00 NH Leeuwenhorst – 8.10 Two Brothers Noordwijk Hotel (50 pax)  
08.15 NH Leeuwenhorst – 8.25 Two Brothers Noordwijk Hotel (50 pax)

08.00 Leiden Central Station (50 pax)  
08.15 Leiden Central Station (50 pax)

#### Return from ESTEC to:

15.15 Two Brothers Noordwijk Hotel – NH Leeuwenhorst (50 pax)  
15.45 Two Brothers Noordwijk Hotel – NH Leeuwenhorst (50 pax)

15.15 Leiden Central Station (50 pax)  
15.45 Leiden Central Station (50 pax)



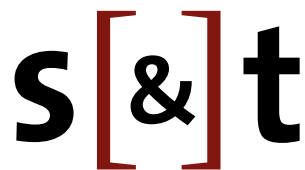
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