GNSS –

EMPOWERING MOBILITY FOR AIR, LAND, SEA … AND BEYOND!

Munich, March 13–15, 2023

3rd ANNOUNCEMENT

MUNICH SATELLITE NAVIGATION SUMMIT 2023

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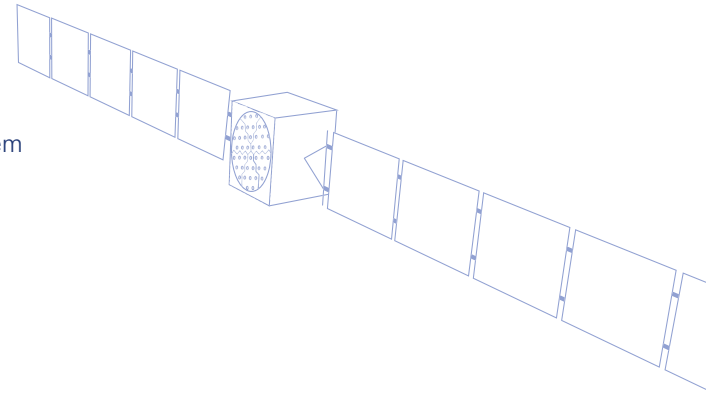
WORK MICROWAVE

"GNSS - EMPOWERING MOBILITY for AIR, LAND, SEA…and BEYOND!", this will be the theme of the 2023 edition of the Munich Satellite Navigation Summit, taking place from March 13–15, 2023!

We are glad to continue the cooperation between the Institute of Space Technology and Space Applications (ISTA) of the University of the Bundeswehr Munich and the Institute of Communications and Navigation of the German Aerospace Center (DLR).

Make sure to check our website for the latest information: www.munich-satellite-navigation-summit.org

The conference program will run under the theme "GNSS - EMPOWERING MOBILITY for AIR, LAND, SEA…and BEYOND!" and will cover the following:



TRENDING TOPICS of the 2023 edition

- First and Second Generation of the European Satellite Navigation System Galileo
- Status and Modernization of the US Global Positioning System and of the Chinese BeiDou System
- Regional Systems of Japan and Korea
- Solutions for Transportation with Precise Point Positioning and Sensor Fusion
- Secure Navigation with Authentication and with the Galileo Public Regulated Service
- Positioning from Low Earth Orbit and with Alternative Terrestrial Technologies
- Legal Aspects of Space Sustainability

…and many more up-to-date topics on GNSS!

ABOUT THE MUNICH SATELLITE NAVIGATION SUMMIT:

The Munich Satellite Navigation Summit is a conference with global impact dealing with satellite navigation now and in the future. The one-of-a-kind convention of high-ranking worldwide speakers from industry, science and governments provides the participants with a broad overview and different perspectives on the latest developments in the field of GNSS. Meet at the welcome reception, discuss upcoming projects at the Space Night and enjoy the closure of the Summit with a Bavarian networking event!

The Summit is part of the efforts of the Bavarian government and the cluster on aerospace and satellite navigation to stimulate applications and services in this high-tech field.

DAY 1. Afternoon. OPENING Monday, March 13, 2023

15:30–16:00 hrs

OFFICIAL OPENING OF THE EXHIBITION AND CHAMPAGNE WELCOME *

sponsored by **NavCert GmbH**

16:15–18:45 hrs

OPENING CEREMONY

This event takes place at the Alte Kongresshalle (Old Congress Hall).
The organisers of the University of the Bundeswehr Munich, the German Aerospace Center, and the Bavarian State Government will open the Summit together with representatives of the European Commission and the European Union Agency for the Space Programme, the European Space Agency, and national space and satellite navigation organisations.

Welcome addresses:

Thomas Pany, Professor of Satellite Navigation, ISTA/FZ Space, University of the Bundeswehr Munich, Neubiberg, Germany
Michael Meurer, Professor, Head of Navigation Department, German Aerospace Center (DLR), Oberpfaffenhofen, Germany
Eva-Maria Kern, President, University of the Bundeswehr Munich, Neubiberg, Germany
Anke Kaysser-Pyzalla, Chair of the Executive Board, German Aerospace Center (DLR), Cologne, Germany
Roland Weigert, State Secretary, Bavarian Ministry of Economic Affairs, Regional Development, and Energy, Munich, Germany
Josef Aschbacher, ESA Director General, European Space Agency (ESA), Paris, France
Rodrigo da Costa, Executive Director, EU Agency for the Space Programme (EUSPA), Prague, Czech Republic
Anna Christmann, Member of the Bundestag, Federal Government Coordinator of German Aerospace Policy, Federal Ministry for Economic Affairs and Climate Action, Berlin, Germany
Stefan Schnorr, State Secretary at the Federal Ministry for Digital and Transport, Berlin, Germany

Moderator:

Claus Kruesken, Presenter, Bayerischer Rundfunk (Bavarian Broadcasting), Munich, Germany

Panel Members:

Paraskevi Papantoniou, Director (acting) for Space, European Commission, Brussels, Belgium
Pascal Claudel, Chief Operating Officer, EUSPA, Prague, Czech Republic
Francisco-Javier Benedicto Ruiz, Director of Navigation, ESA, Paris, France
Harold Martin, National Coordination Office for Space-Based PNT, Washington DC, USA
Jiang De, China Satellite Navigation Office, Beijing, China
Philippe Baptiste, Chairman & CEO, CNES Headquarter, Paris, France *
Anke Pagels-Kerp, DLR, Divisional Board Member for Space, Cologne, Germany

20:00 hrs

STATE RECEPTION in the famous RESIDENZ Munich

hosted by the Bavarian Ministry of Economic Affairs, Regional Development, and Energy
(Bus shuttle will be available)

* to be confirmed

DAY 2. **Morning.** Tuesday, March 14, 2023

9:00–10:30 hrs

Session 1. GNSS PROGRAM UPDATES – GLOBAL, REGIONAL AND AUGMENTATION SYSTEMS

Speakers from the respective organizations and countries present news from the worldwide global, regional and augmentation satellite navigation systems in operation and under development.
Global: GALILEO (EU), GPS (USA), BeiDou (China)
Regional: QZSS (Japan), KPS (Korea)
Augmentation: EGNOS (EU), WAAS (USA), MSAS (Japan)

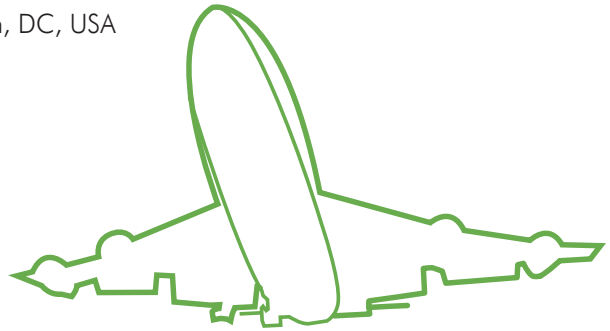
Chairman:

Mike Swiek, Mike International, LLC, Washington, DC, USA

Panel Members:

Xavier Maufroid, Head of Sector Galileo Implementation, Head of GNSS Joint Office, DG DEFIS, EC, Brussels, Belgium **&**
F. Javier de Blas, Commercial and High Accuracy Service Manager, EUSPA, Prague, Czech Republic

Harold Martin, National Coordination Office for Space-Based Positioning, Navigation, and Timing, Washington, DC, USA
Lu Jun, China Satellite Navigation Office, Beijing, China
Satoshi Kogure, Japan Aerospace Exploration Agency (JAXA), Japan
Sharafat Gadimova, UN Office for Outer Space Affairs, Vienna, Austria
Silvia Porfili, EGNOS Project Officer, EUSPA, Prague, Czech Republic
Taegyu Kim, Ministry of Science and ICT, Sejong, Republic of Korea



10:30–10:50 hrs

REFRESHMENT BREAK

10:50–12:10 hrs

Session 2. FUTURE TRANSPORTATION ON LAND AND AT SEA

Trends such as increasing traffic volumes, autonomy and automation, cyber threats, decarbonization, and urbanization pose a real challenge for future transportation systems on land and water. The needs of pedestrians, road and rail users, and maritime and inland waterway users require new approaches to positioning and navigation to meet increased demands for accuracy, integrity, resilience, availability, and flexibility. Technologies such as sensor fusion, 5G integration, artificial intelligence and machine learning, GNSS augmentation, and authentication can help to meet these requirements. The session will explore the topic from different angles from both a user and system perspective.

Chairwoman:

Karen Van Dyke, Director, Positioning, Navigation, and Timing (PNT) and Spectrum Management, DOT, Washington DC, USA

Panel Members:
Karen Van Dyke, Director, Positioning, Navigation, and Timing (PNT) and Spectrum Management, DOT, Washington DC, USA
Valentin Barreau, Train Localisation Project Manager, SNCF, Toulouse, France
Stig Erik Christiansen, Product Manager, Kongsberg Seatex AS, Trondheim, Norway
Martin Haueis, Head of Map Processing and Vehicle Localization, Mercedes-Benz, Stuttgart, Germany
Jeremy Bennington, VP of Position, Navigation & Time (PNT) Assurance, Spirent Communications, Crawley, UK

12:15–13:15 hrs

Session 3. GNSS AND SPACE SUSTAINABILITY

This year´s Legal Session, organized and moderated by BHO Legal, will focus on GNSS and space sustainability. Space sustainability and specific aspects such as space debris mitigation are high on the space policy agenda worldwide. However, GNSS in MEO has so far not been in the focus. The session will present the overall issue of space sustainability, the different action streams in this regard, the space debris situation in MEO, current mitigation policies by GNSS operators and further aspects.

Chairmen:
Ingo Baumann, BHO Legal, Cologne, Germany
Oliver Heinrich, BHO Legal, Cologne, Germany

Panel Members:
Matija Renčelj, Research Manager, European Space Policy Institute, Vienna, Austria
Holger Krag, Head of Space Debris Office, ESA, Darmstadt, Germany
Christoph Kautz, Head of Unit, Secure Connectivity, Space Surveillance & Applications, DG DEFIS, EC, Brussels, Belgium
André Bauerhin, Managing Director, Spaceopal, Munich, Germany

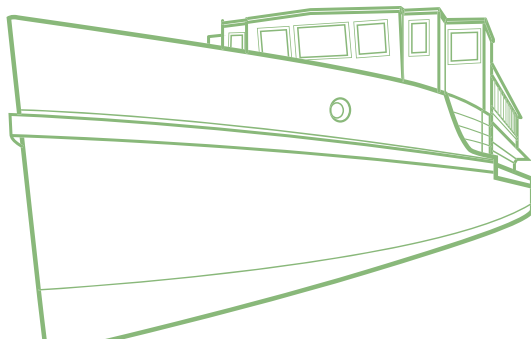
13:15–14:30 hrs

NETWORKING LUNCHEON

13:40–14:30 hrs

APPLICATIONS FOR NEXT EVOLUTION OF HIGH ACCURACY NAVIGATION SERVICES

Roundtable Discussion hosted by Spaceopal – for registered guests only
This year, Spaceopal, Europe's leading provider of global navigation services, is hosting the Summits Roundtable to discuss applications and innovative solutions for the next generation of high accuracy navigation services with key stakeholders from the European navigation, telecommunications and automotive sectors.
Please register for free through your online registration.



DAY 2. Afternoon.

14:30–16:00 hrs

Session 4. FUTURE AIR TRANSPORTATION – VISION, CHALLENGES AND TECHNOLOGIES APPROACHING AUTONOMY AND AUTOMATION

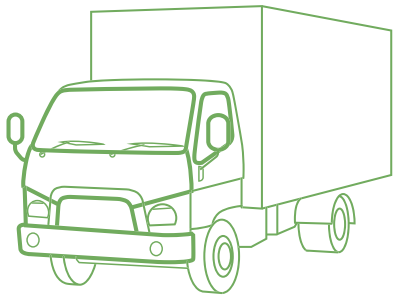
Aeronautics is facing major challenges like decarbonization, reduction of noise or increase of freight and passenger traffic, while keeping a high level of safety and (cyber) security. Substantial transitions are ongoing from controller guided aviation to autonomy and automation or from uniform to mixed airspaces with new entrants including air taxis and unmanned aerial vehicles (UAV). Very low airspaces will allow for urban air mobility of freight and passengers. Reliable, safe and secure navigation is paramount for future concepts. The session will address the challenges as well as technologies and systems to enhance safety, robustness, and efficiency of airborne operations both for classic aircraft but also for air taxis and small UAVs in lower air spaces.

Chairman:

Michael Meurer, Head of Navigation Department, German Aerospace Center (DLR), Institute of Communications and Navigation, & Full Professor, RWTH Aachen University, Aachen, Germany

Panel Members:

Michael Meurer, Head of Navigation Department, German Aerospace Center (DLR), Institute of Communications and Navigation, & Full Professor, RWTH Aachen University, Aachen, Germany
Gregory Thompson, WAAS Program Manager, Federal Aviation Administration (FAA), Washington DC, USA
Todd Walter, Professor of Aeronautics and Astronautics, Stanford University, Palo Alto CA, USA
Andreas Thellmann, Head of Air Mobility Initiative, Airbus Urban Mobility, Munich, Germany
Sven Wlach, Lead Systems Engineer, Phoenix-Wings, Ismaning, Germany
Stefan Milz, CEO/CTO, Spleenlab, Saalburg-Ebersdorf, Germany



16:00–16:30 hrs

REFRESHMENT BREAK

16:30–17:55 hrs

Session 5. SECURE NAVIGATION

Safety & Security related applications have very stringent requirement for the robustness, integrity and cyber-security of the GNSS-signals used. To fulfill these user requirements dedicated Galileo services are under implementation. For private and commercial applications the Galileo Open Service Navigation Message Authentication (OS-NMA) and later on the Commercial Authentication Service (CAS) will be introduced and for governmental authorized users the Galileo Public Regulated Service (PRS) is foreseen. This session will provide an up-to-date overview on the current implementation status of these services, receiver developments and planned next steps with a focus on test- and validation-campaigns for various safety & security related applications.

Chairmen:

Stefan Baumann, Programme Manager, IABG, Ottobrunn, Germany
F. Javier de Blas, Commercial and High Accuracy Service Manager, EUSPA, Prague, Czech Republic

Panel Members:
F. Javier de Blas, Commercial and High Accuracy Service Manager, EUSPA, Prague, Czech Republic
Ernst Phillip Mrohs, Research and Development, NavCert GmbH, Munich, Germany
Representative of Qascom, Bassano di Grappa, Italy
Fabien Frossard, Service Engineering Manager A.I, EUSPA, Prague, Czech Republic
Frank Wilms, Principal at FDC, Vincennes, France
Ronald Nippold, DLR Institute of Transportation Systems, Braunschweig, Germany

18:00–19:15 hrs

Session 6. MULTI-SENSOR INTEGRATION

Virtually all mobile platforms use multi-sensor navigation systems to increase robustness, accuracy and availability. A good understanding of novel and traditional sensors characteristics and methods to integrate these sensor measurements are essential to provide solutions for upcoming space-, air- and land-borne applications. This understanding is also necessary to shape future GNSS services (from MEO or LEO) to ensure a maximum of synergy for the users benefit. There is a growing number of female researchers interested in this important area of PNT and broader areas of science, engineering, and technology. This panel will feature leading international women experts in the field of PNT to highlight current integration trends, discuss challenges for future developments, and present visions of next generation integrated systems.

Chairwoman:
Jade Morton, Director, Colorado Center for Astrodynamics Research (CCAR), University of Colorado, Boulder, CO, USA

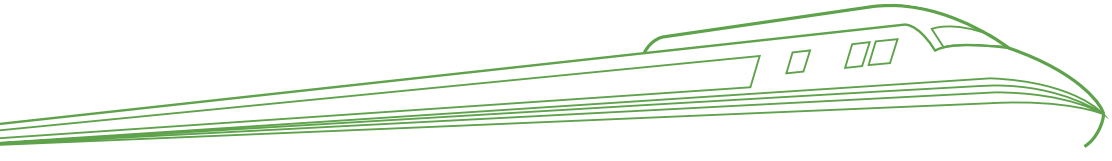
Panel Members:
Dorota Grejner-Brzezinska, Professor, Lowber B. Strange Endowed Chair in Engineering, The Ohio State University, Columbus, OH, USA
Rong Yang, Ass. Professor, School of Aeronautics and Astronautics, Shanghai Jiao Tong University, Shanghai, China
Yueyang Zou, Institute of Quantum Optics, Leibniz Universität Hannover, Germany
Anja Grosch, Institute of Communications and Navigation, DLR, Wessling, Germany
Daniela Sánchez Morales, ISTA, University of the Bundeswehr Munich, Munich, Germany
Sophie Damy, Project Officer, Joint Research Center, EC, Ispra, Italy

19:30 hrs

EVENING RECEPTION: Munich Space Night 2023

at the Alte Kongresshalle (Old Congress Hall)
sponsored by **AIRBUS**

We are looking very much forward to meeting you for drinks and food and great networking opportunities.



DAY 3. **Morning.** Wednesday March 15, 2023

9:00–10:25 hrs

Session 7. PRECISE POINT POSITIONING (PPP)

Although more than 20 years old, precise point positioning is still considered a very advanced and demanding technique within satellite navigation due to its high precision and global coverage. Commercial service providers offer proven PPP solutions to support autonomous systems and are recently challenged by public services. The discussion of ongoing technological developments for PPP and a glimpse into what can be expected from PPP will help to understand the market in a better way and the PPP applications to come. Our considerations especially go to future technologies like inter-satellite-links or to supporting satellites in a low Earth orbit.

Chairwoman:

Carla Filotico, Partner, SpaceTec Partners, London, UK

Panel Members:

André Bauerhin, Managing Director & COO spaceopal GmbH, Munich, Germany
Ignacio Fernández Hernández, Galileo Authentication and High Accuracy Service Manager, European Commission, Brussels, Belgium
Stefan Junker, Engineering Director, Trimble, Höhenkirchen, Germany
F. Javier de Blas, Commercial and High Accuracy Service Manager, EUSPA, Prague, Czech Republic
Pierluigi Mancini, Head of ESA NAVISP Programme, Paris, France
Anselm Adams, Founder & CEO, Albora, London, UK
Irma Rodriguez Perez, Director of Navigation Products and Services, GMV, Tres Cantos, Spain

10:30–11:30 hrs

Session 8. GNSS-PROMOTED INTELLIGENCE IN MOBILITY IN CHINA

The applications of multi-constellation GNSS have improved the intelligent level of travel services in China. Innovation of GNSS accuracy, reliability, ubiquity and its integration with navigation information is constantly developing. GNSS have been continuously used to improve the digitalization level and AI application scenarios in the fields of urban mobility, aviation air traffic control and airport services, marine S&R and shipping. In this session four speeches about these innovated applications in urban/air/marine in China are going to be arranged, and relevant topics will be discussed with the participants after presentations.

Chairman:

Gui'fei Jing, Research Institute of Frontier Science, Beihang University, Beijing, China

Panel Members:

Dongkai Yang, Professor, School of Electronic and Information Engineering, Beihang University, Beijing, China
Falong Liu, China Transport Telecommunications and Information Center, Ministry of Transport of China, Beijing, China
Baoguo Yu, Professor, Director of State Key Laboratory of Satellite Navigation System and Equipment Technology of China, Beijing, China
Chuang Shi, Professor, Director of Key Laboratory of Integration of Satellite Navigation and Mobile Communication Technology, Ministry of Industry and Information Technology of China, Beijing, China

11:30–11:50 hrs REFRESHMENT BREAK

11:50–13:20 hrs

Session 9. POSITIONING, NAVIGATION AND TIMING FROM LOW EARTH ORBIT

The major success of GNSS results in an increased demand of performance and robustness by current and future users. In order to meet such demands, GNSS may be complemented by satellites in different orbits. In this context, a Positioning, Navigation and Timing (PNT) system from Low Earth Orbit (LEO) is able to provide a number of benefits contributing to seamless, reliable, resilient and accurate PNT services. This session will discuss the status and opportunities related to various international LEO PNT initiatives both with dedicated satellites/payloads or signals of opportunity.

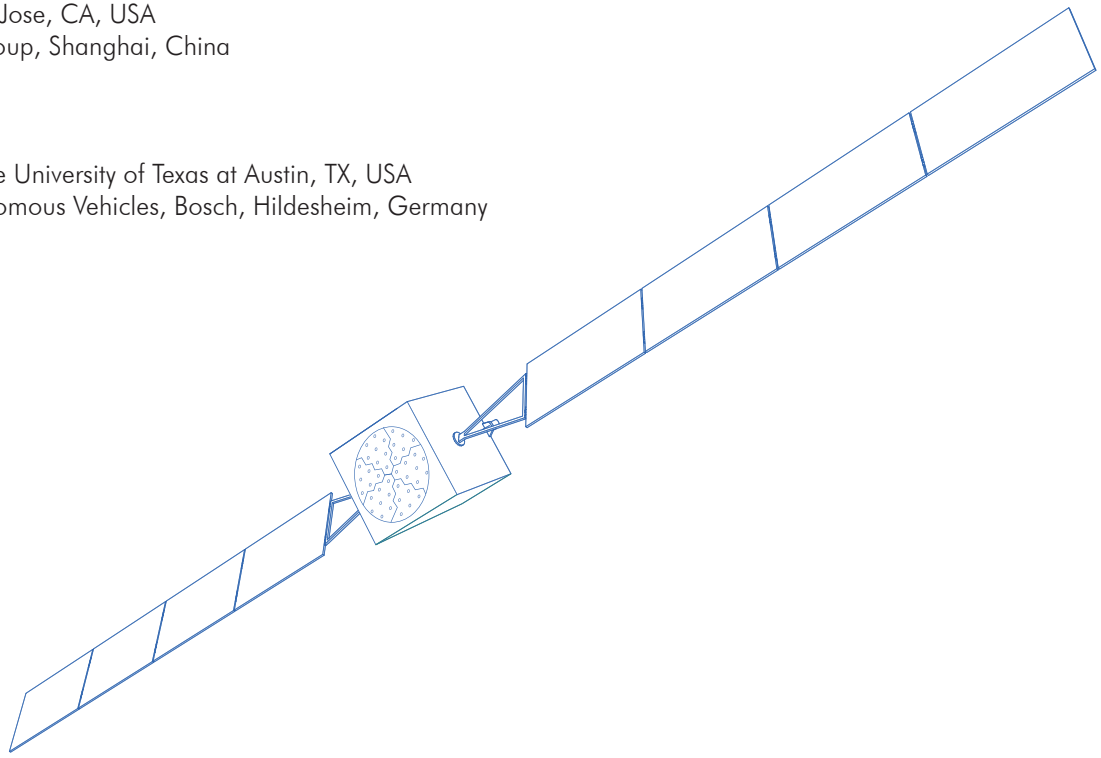
Chairmen:

Roberto Prieto Cerdeira, G2G Satellite Payload Manager/LEO-PNT Project Manager, ESA/ESTEC,Noordwijk, The Netherlands
Jérémie Godet, Head of the IRIS^2 Implementation Task Force, DG DEFIS, EC, Brussels, Belgium

Panel Members:

Brian Manning, Co-Founder & CEO, Xona Space Systems, San Jose, CA, USA
Wang Xuan, Strategy Director, Geespace, Geely Technology Group, Shanghai, China
Bruno Bougard, R&D Director, Septentrio, Leuven, Belgium
Michel Monnerat, Head of Satellite Navigation, Thales, France
Andrés Juez Muñoz, GMV, Madrid, Spain
Todd Humphreys, Professor, Cockrell School of Engineering, The University of Texas at Austin, TX, USA
Nikolay Mikhaylov, Senior Expert GNSS – Navigation on Autonomous Vehicles, Bosch, Hildesheim, Germany

13:20–14:30 hrs NETWORKING LUNCHEON



DAY 3. Afternoon.

14:30–15:55 hrs

Session 10. ALTERNATIVE POSITIONING, NAVIGATION AND TIMING (APNT)

Complementing space based PNT by terrestrial navigation signals increases the general PNT-resilience against jamming/spoofing and/or provides higher accuracy and availability in areas that are difficult to access for space borne signals. Efforts conducted by the mobile communications community (4G, 5G and beyond) will be discussed here, as well as developments of dedicated terrestrial navigation systems following the signal-of-opportunity (e.g. television broadcast signals) or Pseudolite concept (as an overlay to existing GNSS signals or within new frequency bands). The implications of those technologies for transportation are a core focus in this session.

Chairman:
Sunwoo Kim, Department of Electronic Engineering Hanyang University; Director, 5G/Unmanned Vehicle Research Center (ITRC), Seoul, Korea

Panel Members:
Ganesh Pattabiraman, CEO & President, NextNav, San Francisco CA, USA
Thomas Janner, Director of R&D Broadcast Applications, Rohde & Schwarz, Munich, Germany
Sowmyashree Lakshmaiah, Director Navigation Simulators, WORK Microwave GmbH, Holzkirchen, Germany
Jose Antonio del Peral Rosado, Future Navigation Programs, Airbus Defence and Space, Taufkirchen, Germany
Okuary Osechas, Head Alternative Navigation Systems Group, DLR Institute of Communications and Navigation, Wessling, Germany

16:00–17:00 hrs

Session 11. BAVARIAN & MUNICH FLASHLIGHTS – NEWS FROM GNSS FOR AUTOMOTIVE

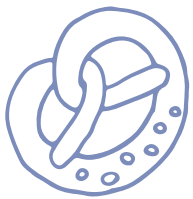
Experts from the Bavarian satellite navigation network of excellence, the Bavarian Cluster Aerospace as well as from other high-tech companies report on their developments and activities. This year a special emphasis will be put on solutions for the automotive sector. You are invited to experience more from the highly innovative scene contributing to future mobility.

Chairwoman:
Bärbel Deisting, Director Space and Space Applications, bavAIRia e.V., Gilching, Germany

Panel Members:
Stefan Baumann, Programme Manager, IABG, Ottobrunn, Germany
Patrick Henkel, Founder and Managing Director, Advanced Navigation Solutions – ANavS GmbH, Munich, Germany
Daniel Seybold, CEO, TeleOrbit GmbH, Nuremberg, Germany
Ernst Phillip Mrohs, Head of Laboratory, NavCert GmbH, Munich, Germany
Stefan Schlüter, Head of the Department of Systems Analysis and Evolution, DLR Galileo Competence Center, Wessling, Germany
Rolf Kozlowski, Managing Director, DLR GfR, Wessling, Germany

17:00 hrs

Closing of the Summit and Invitation to the Bavarian Networking Event at the Alte Kongresshalle (Old Congress Hall)



Bavarian NETWORKING

at 17:00 hrs

This year the Summit will close with a special
Bavarian Networking Event in the exhibition area,
offering a glimpse into
Bavarian cuisine, beer culture, and folk music.

At this reception you will have the possibility
to let the conference end in a relaxed way.
There is room to get into conversation with people
from companies in and outside Munich, with
stakeholders and potentially interesting partners.

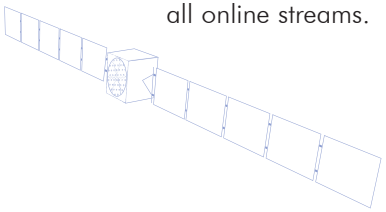
REGISTRATION

Online registration is possible via the website
www.munich-satellite-navigation-summit.org

Virtual participation fee:

Virtual participation
€ 350,00
valid at all times

The registration for the virtual participation includes access to all online streams.



On site participation fees:

Regular rate	Speaker rate
€ 900,00	€ 250,00
valid from February 1, 2023	valid at all times

The registration fee includes access to all sessions (onsite and via online stream), to various networking opportunities like the reception on the first evening as well as visiting the technical exhibition, admission to the lunches, coffee/tea, snacks and refreshments during the conference and the retrieving of the conference proceedings.

Which Registration Suits You Best?	In-Person	Virtual
Access to the latest GNSS Developments and Program Updates	✗	✗
▪ Access to all Sessions	✗	✗
▪ Attendance to Premium Talks	✗	
▪ Access to Online Session Streaming	✗	✗
▪ Real-Time Q&A and Discussions with Presenters	✗	
▪ Receive Electronic Conference Proceedings	✗	
Participation in Various Networking Events	✗	
▪ Welcome Reception	✗	
▪ GNSS Space Night	✗	
▪ Various Round Tables	✗	
▪ Access to lunches, coffee/tea breaks with snacks and refreshments	✗	
Connect and network with Peers, Employers, GNSS Experts in Person	✗	
Attend the Exhibition Trade Show in Person	✗	
Identify Market, Programmatic and Research Trends	✗	
Experience New Cultural Location	✗	
No Travel Required		✗

CANCELLATION/REFUND POLICY

Written cancellations until February 18, 2023 are refundable less € 95,00 cancellation fee. After February 18, 2023 there will be no refunds.
We regret that individual registration benefits are not transferable.

EXHIBITION

The Munich Satellite Navigation Summit will give your business a unique opportunity to position your latest products, services and technologies.
Manufacturers, organisations and service providers are invited to exhibit at this event. Please contact us for further information.

SUPPORT

We offer different packages for companies and institutions that are interested to be an official partner of the conference. If you would like to contribute, please contact us for further details.

CONTACT

Munich Satellite Navigation Summit, Phone +49 89 6004 3425
info@munich-satellite-navigation-summit.org
www.munich-satellite-navigation-summit.org

DAY	TIME	LOCATION	EVENT
DAY 1	15:30 hrs	Alte Kongresshalle	Exhibition Opening
	16:00 hrs		
	16:15 hrs - 18:45 hrs	Am Bavariapark 14 80339 Munich	Opening Plenary Panel Exhibition
	20:00 hrs	Residence Munich	State Reception
DAY 2	9:00 hrs - 19:15 hrs	Alte Kongresshalle	Conference
	9:00 hrs - 19:30 hrs	Alte Kongresshalle	Exhibition Summit Space Night 2023
DAY 3	9:00 hrs - 17:00 hrs	Alte Kongresshalle	Conference
	9:00 hrs - 17:00 hrs	Alte Kongresshalle	Exhibition
	17:00 hrs -	Alte Kongresshalle	Bavarian Networking

The Munich Satellite Navigation Summit 2023 is organized by

ISTA Institute of Space Technology & Space Applications & Forschungszentrum Space Universität der Bundeswehr München & ITIS of Universität der Bundeswehr München & DLR Deutsches Zentrum für Luft- und Raumfahrt German Aerospace Center Institute of Communications and Navigation

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