



Royal Institute of Navigation



University of Zagreb
Faculty of Transport
and Traffic Sciences



Sveučilište u Rijeci
TEHNIČKI FAKULTET



13th BAŠKA GNSS CONFERENCE

Baška, Krk Island, Croatia,

12 - 15 May, 2019

CONFERENCE PROGRAMME

TECHNICAL CO-SPONSORS

The European Academy of Sciences and Arts

Beihang University

University of Zagreb, Faculty of Science, Department for Mathematics

Zagreb University of Applied Sciences

Krapina University of Applied Sciences

Media coverage: Coordinates Magazine

Salzburg

Beijing

Zagreb

Zagreb

Krapina

New Delhi

Austria

China

Croatia

Croatia

Croatia

India

Welcome to 13th Annual Baška GNSS Conference!

The *Royal Institute of Navigation, London, UK; University of Rijeka, Faculty of Maritime Studies, Rijeka, Croatia; University of Zagreb, Faculty of Transport and Traffic Sciences, Zagreb, Croatia;* and *University of Rijeka, Faculty of Engineering, Rijeka, Croatia* have a privilege in welcoming you to the **13th Annual RIN Baška GNSS Conference** to be held in **Baška, Krk Island, Croatia** on **12 – 15 May, 2019**. This traditional and unique event aims to gather worldwide experts in satellite navigation and related disciplines, and focuses on GNSS resilience and GNSS applications development. The unique environment of Baška, its natural resources, and rich history and culture, combined with traditional hospitality, will again create an inspiring atmosphere for ideas and knowledge exchange, well known to those who attended the previous conferences in the series.

The **latest developments** in regard to the forthcoming conference can be followed at the **RIN website**: <http://www.rin.org.uk>.

Attractive and affordable all-inclusive 5-, 4-, and 3-star hotel accommodation packages for conference participants are offered. Interested parties should contact **Assist Prof David Brčić** (e-mail: davidbrbic@gmail.com). Complementary local transfer is to be arranged between Zagreb Airport and Baška. Interested parties should contact **Ms Irena Popović** (e-mail: ipopovic245@gmail.com) for information and booking.

Finally, the participants are advised that the **UN International Space Weather Initiative (ISWI) Workshop** will be held in **Trieste, Italy, 20 – 24 May, 2019**. More details, including the programme and registration, are available at: <http://indico.ictp.it/event/8682>. Baška GNSS Conference sponsors will organise a **complementary coach transfer from Baška to Trieste on 17 May, 2019**. Interested parties should contact immediately **Ms Irena Popović** (e-mail: ipopovic245@gmail.com) for booking.

We are looking forward for the privilege to welcome you to Baška.

Conference Programme Chair

International Programme and Organising Committee

International Programme and Organising Committee

John R Pottle, Director, The Royal Institute of Navigation, London, UK, Conference Chair

Jasna Prpić-Oršić, Faculty of Engineering, University of Rijeka, Croatia, Conference Co-chair

Serdjo Kos, FRIN, Faculty of Maritime Studies, University of Rijeka, Croatia, Conference Co-chair

Tomislav Kos, FRIN, Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia, Conference Co-chair

Hrvoje Gold, Faculty of Transportation and Traffic Sciences, University of Zagreb, Croatia, Conference Co-chair

Mia Filić, MRIN, independent satellite navigation, statistical learning and space weather specialist, Sesvete, Zagreb, Croatia, Conference Programme Chair

Terry Moore, FRIN, President, The Royal Institute of Navigation, London, UK

Jeffrey M Auerbach, US Department of State, Washington, DC, USA

David Brčić, MRIN, Faculty of Maritime Studies, University of Rijeka, Croatia

Ljiljana R Cander, Rutherford Appleton Laboratory, Chilton, UK

Olja Čokorilo, Faculty of Transport and Traffic Engineering, University of Belgrade, Serbia

Jordi Corbera, Institut Cartogràfic i Geològic de Catalunya, Barcelona, Spain

Giovanni E Corazza, University of Bologna, Italy

Robert Crane, National Coordination Office for Space-Based PNT, Washington, DC, USA

Franc Dimc, Faculty of Maritime Studies and Transport, University of Ljubljana, Portorož, Slovenia

Sharafat Gadimova, UN Office of Outer Space Affairs, Vienna, Austria

Alan Grant, FRIN, The GLA of the United Kingdom and Ireland, London, UK

Luka Grubišić, Dept for Mathematics, Faculty of Science, University of Zagreb, Croatia

Josip Josipović, CROCONTROL, Zagreb, Croatia

Oliver Jukić, College for Management in Tourism and Informatics, Virovitica, Croatia

Ines Kolanović, Faculty of Maritime Studies, University of Rijeka, Croatia

Siniša Krajnović, LM Ericsson, Stockholm, Sweden

Bal Krishna, Coordinates Journal, Delhi, India

Marta Krywanis-Brzostowska, European GNSS Agency, Prague, Czech Republic

David Last, FRIN, Consultant Engineer and Expert Witness, Conwy, UK

Kristijan Lenac, MRIN, Faculty of Engineering, University of Rijeka, Croatia

Igor Larin, ISS Reshetnev Corporation, Moscow, Russia

Anastasia Lyubimova, GLONASS/GNSS Forum Association, Moscow, Russia

Roger A McKinley, Consultant, Leatherhad, UK

Krešimir Meštrović, Zagreb University of Applied Sciences, Zagreb, Croatia

Tomislav Josip Mlinarić, Faculty of Transport and Traffic Sciences, University of Zagreb, Croatia

Washington Y Ochieng, FRIN, Imperial College, London, UK

Sergey Revivnykh, ISS Reshetnev Corporation, Moscow/Zheleznogorsk, Russia

Enik Shytermeja, Ecole Nationale de l'Aviation Civile, Toulouse, France

Grigory Stupak, Russian Space Systems, Moscow, Russia

Marko Ševrović, FRIN, Faculty of Transport and Traffic Sciences, University of Zagreb, Croatia

Darko Špoljar, PhD student, Faculty of Engineering, University of Rijeka, Rijeka, Croatia

James Taylor, FRIN, The Royal Institute of Navigation, London, UK

Marko Valčić, Faculty of Engineering, University of Rijeka, Croatia

Josip Vuković, Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia

Adam Weintrit, FRIN, Faculty of Navigation, Gdynia Maritime University, Gdynia, Poland

Jingnong Weng, Beihang University, Beijing, China

Local organising committee (logistics)

Assist Prof David Brčić, MRIN, Faculty of Maritime Studies, University of Rijeka, Croatia, Chair

Ivana Kovačić, Baška Tourist Office, Baška, Croatia

Luca Maras, Valamar Hotels & Resorts, Poreč, Croatia

Tomislav Josip Mlinarić, Faculty of Transport and Traffic Sciences, University of Zagreb, Croatia

Irena Popović, University College of Applied Sciences Hrvatsko Zagorje Krapina, Krapina, Croatia

Nenad Sikirica, University College of Applied Sciences Hrvatsko Zagorje Krapina, Krapina, Croatia

Majda Šale, Krk Island Tourist Office, Krk, Croatia

Venue map (hotels and the Great Baška Beach) (Source: OpenStreetMap)



12 May, 2019		
20.30	Conference opening Ice-breaking dinner (dress code: smart casual)	Restaurant Jelena, Hotel Zvonimir
13 May, 2019		
8.30	Registration	Conference Hall I, Corinthia Hotel
9.00	<p><u>Welcome speeches</u></p> <p>Ministry of Science and Education, Republic of Croatia</p> <p>Ms Marina Medarić, Deputy County President, County Primorsko-Goranska</p> <p>Toni Juranić, Mayor of Baška, Baška, Croatia</p> <p>Prof Jasna Prpić-Oršić, PhD, Dean, Faculty of Engineering, University of Rijeka, Croatia</p> <p>Prof Alen Jugović, PhD, Dean, Faculty of Maritime Studies, University of Rijeka, Croatia</p> <p>Prof Tomislav Josip Mlinarić, PhD, Dean, Faculty of Transport and Traffic Sciences, University of Zagreb, Croatia</p> <p>Assist Prof Marko Horvat, PhD Zagreb University of Applied Sciences, Zagreb, Croatia</p> <p>Prof Serdjo Kos, PhD FRIN, International Programme and Organising Committee, 13th Annual Baška GNSS Conference</p>	Conference Hall I, Corinthia Hotel

	<p><i>Opening:</i></p> <p>Mr John R Pottle, BSc MBA FRIN, Director, The Royal Institute of Navigation, London, UK</p>	
<p>Plenary session I: Innovative GNSS</p> <p>Chair: <i>Prof Serdjo Kos, PhD FRIN, Member of the European Academy of Sciences and Arts, Faculty of Maritime Studies, University of Rijeka, Rijeka, Croatia</i></p>		
10.00	<p>Assist Prof Franc Dimc, PhD, Faculty of Maritime and Transport Studies, University of Ljubljana, Portorož, Slovenia <i>keynote lecture</i></p> <p><i>On Blaming Human Factor at Sea - a Driving Force for the GNSS Improvements</i></p>	Conference Hall I, Corinthia Hotel
10.30	<p>Prof Jasna Prpić – Oršić, PhD, Dean, Faculty of Engineering, University of Rijeka, Rijeka, Croatia <i>keynote lecture</i></p> <p><i>Decision support system for green and safe ship routing</i></p>	Conference Hall I, Corinthia Hotel
11.00	<p>Professor Yanhong Kou, PhD, Beihang University, Beijing, China <i>keynote lecture</i></p> <p><i>Synchronous GPS spoofing signal generation</i></p>	Conference Hall I, Corinthia Hotel
11.30	Coffee break	Conference Hall II, Corinthia Hotel
<p>Session: Navigation algorithms and signal processing for GNSS</p> <p>Chair: <i>Assoc Prof Kristijan Lenac, PhD MRIN, Faculty of Engineering, University of Rijeka, Croatia</i></p>		
12.00	<p>Prof Boris Sviličić, PhD, Faculty of Maritime Studies, University of Rijeka, Croatia <i>keynote lecture</i></p> <p><i>GNSS-based Maritime Navigation Systems: Cyber Threats Sourcing</i></p>	Conference Hall I, Corinthia Hotel

12.30	Svyatoslav Y Burtsev, Mendeleevo, Russia <i>Method for estimating the error of pseudorange generation on the carrier phase by GNSS signal simulators</i>	Conference Hall I, Corinthia Hotel
13.00	Mia Filić, MRIN, Faculty of Computer and Information Science, University of Ljubljana, Slovenia <i>GNSS Navigation Message Authentication Using TESLA</i>	Conference Hall I, Corinthia Hotel
13.30	Lunch	Restaurant Jelena, Hotel Zvonimir
15.00	Meeting of the International Programme and Organising Committee	Bistro Funtana (Corinthia Hotel)
Plenary session II: Core GNSS System Status		
Chair: Mr John R Pottle, <i>BSc MBA FIET</i> , <i>Director, The Royal Institute of Navigation, London, UK</i>		
16.00	Mr David Turner, Deputy Director, Office of Space and Advanced Technology, US Department of State, Washington, DC <i>keynote lecture</i> <i>GPS status update</i>	Conference Hall I, Corinthia Hotel
16.20	Mr Sergey Rybkin, GLONASS PNT Center, Roscosmos State Space Corporation, Moscow, Russia <i>keynote lecture</i> <i>GLONASS System Status and Use</i>	Conference Hall I, Corinthia Hotel
16.40	Dr Chundi Xiu, BeiDou International Exchange and Training Center of China Satellite Navigation Office (CSNO) Beijing, China <i>keynote lecture</i> <i>BDS Status Update and International Education</i>	Conference Hall I, Corinthia Hotel
17.00	Dr Matteo Paonni, Joint Research Centre (JRC),	Conference Hall I, Corinthia Hotel

	European Commission, Ispra, Italy <i>keynote lecture</i> <i>Galileo status up-date</i>	
17.45	Technical visit (gathering point: Hotel Zvonimir Reception)	Baška Port (walking tour)
20.30	Introductory cocktail	Restaurant Jelena Terrace on Baška Promenade, Zvonimir Hotel
21.00	Conference Gala Dinner with live music (<i>Klapa Tramuntana</i>) (dress code: smart casual)	Restaurant Jelena, Zvonimir Hotel
14 May, 2019		
Parallel session I : Resilient GNSS development		
<i>Chair: Dr Josip Vuković, Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia</i>		
9.00	Barbara Pongračić, Rijeka, Croatia / Beijing, China <i>Automatic semivariogram function fitting for regional ionospheric maps</i>	Conference Hall I, Corinthia Hotel
9.20	Ivan Rumora, AFRIN, Pula, Croatia <i>Tropospheric effects on maritime GNSS positioning performance during a storm development</i>	Conference Hall I, Corinthia Hotel
9.40	David Brčić, MRIN, Rijeka, Croatia <i>On modification of the Klobuchar model for the area of Northern Adriatic based on ionospheric maps</i>	Conference Hall I, Corinthia Hotel
10.00	Renato Filjar, FRIN, Kallinovac/Baška, Croatia <i>Positioning performance analysis methodology for GNSS applications</i>	Conference Hall I, Corinthia Hotel

Parallel session II: GNSS applications		
<i>Chair: Assist Prof Marko Valčić, PhD, Faculty of Engineering, University of Rijeka, Croatia</i>		
9.00	Mr John R Pottle, BSc MBA FIET, Director, The Royal Institute of Navigation, London, UK <i>keynote lecture</i> <i>The UK up-date to robust PNT</i>	Conference Hall II, Corinthia Hotel
9.20	A Druzhin, Sankt Petersburg, Russia <i>The Results of GNSS Timing Parameters Monitoring</i>	Conference Hall II, Corinthia Hotel
9.40	Matej Bažec, Portotož, Slovenia <i>Decoding AIS messages with the use of lower performance Software Defined Radio</i>	Conference Hall II, Corinthia Hotel
10.00	Davor Šakan, Rijeka, Croatia <i>Challenges of adaptive coastal voyage planning</i>	Conference Hall II, Corinthia Hotel
10.20	Coffee break	Bistro Funtana, Corinthia Hotel
Session: Student Paper Session		
<i>Chair: Assist Prof David Brčić, PhD MRIN, Faculty of Maritime Studies, University of Rijeka, Croatia</i>		
11.00	Aleksandar Žic, Rijeka, Croatia <i>GPS single frequency positioning errors estimation based on reference station observations in the Adriatic region</i>	Conference Hall I, Corinthia Hotel
11.20	Darko Špoljar, Djurdjevac, Croatia <i>Satellite-based positioning model as an optimisation problem solution</i>	Conference Hall I, Corinthia Hotel
11.40	Silvio Šimunić, Rijeka, Croatia	Conference Hall I, Corinthia Hotel

	<i>A blockchain application for validating the path traveled by a drone</i>	
12.15	<p style="text-align: center;">Conference summary – Clare Stead, The Royal Institute of Navigation, London, UK</p> <p style="text-align: center;">Presentation of the Best Student Paper Award - Closing ceremony</p> <p style="text-align: center;"><i>Chairs: Mr John Pottle, FIET, Prof Serdjo Kos, FRIN, Prof Hrvoje Gold, Prof Tomislav Kos, FRIN</i></p>	Conference Hall I, Corinthia Hotel
13.15	Lunch	Restaurant, Hotel Zvonimir
<p>UN International Committee on GNSS (ICG) 8th Workshop on GNSS Interference Detection and Mitigation</p> <p>Open access for all the 13th Annual Baška GNSS Conference participants, and the UN ICG members</p> <p>Co-chaired by:</p> <p><i>Mr Stephen R Hamilton, US Coast Guard, USA Mr Weimin Zhen, China Research Institute of Radiowave Propagation (CRIRP), China</i></p>		
15.00	Opening discussion moderated by Session chairmen	Conference Hall I, Corinthia Hotel
15.10	<p style="text-align: center;">Dr Deok Won Lim, Korea Aerospace Research Institute, Korea</p> <p style="text-align: center;"><i>Development and Operation of a GPS Jammer Localization System at Incheon International Airport</i></p>	Conference Hall I, Corinthia Hotel
15.30	<p style="text-align: center;">Mr Takahiro Mitome, SKY Perfect JSAT Corporation, Japan</p> <p style="text-align: center;"><i>Measurement Test of Purchased Radio Equipment – Short Range Device</i></p>	Conference Hall I, Corinthia Hotel
15.50	<p style="text-align: center;">Dr Matteo Paonni, Joint Research Centre, European Commission, Italy</p>	Conference Hall I, Corinthia Hotel

	<i>Interference from Amateur Services to GNSS within the 1260 MHz – 1300 MHz band (Galileo E6/Beidou B3 band)</i>	
16.10	Prof Weimin Zhen, China Research Institute of Radio-wave Propagation, China <i>Project Introduction: GNSS Interference Detection and Localization in the City</i>	Conference Hall I, Corinthia Hotel
16.40	Mr Egor Zheltonogov, Geysler – Telecom Ltd., Russia <i>Systematization of Information on Various Types of GNSS receivers and Various Types of Interference</i>	Conference Hall I, Corinthia Hotel
17.10	Mr Gerhard Berz, Eurocontrol, EU/Belgium <i>Alerting Process Related to Areas of GNSS Disruption (Current Disruptions in the Eastern Mediterranean Sea) (tele-presentation)</i>	Conference Hall I, Corinthia Hotel
17.40	Mr Sergey Silin, NAVIS Inc., Russia <i>Actual issues of navigation conditions monitoring</i>	Conference Hall I, Corinthia Hotel
18.00	Summary given by Session chairmen <i>Adjourn</i>	Conference Hall I, Corinthia Hotel
19.00	Regular dinner, as a part of the conference accommodation package	Restaurant, Hotel Corinthia

15 May, 2019		
UN International Committee on GNSS (ICG) WG-S 8th IDM Workshop Baška, Krk Island, Croatia,		
9.00 – 18.00	UN ICG WG-S 8th IDM Workshop (cont.)	Conference Hall I, Corinthia Hotel
UN ICG WG-S members and 13th Baška GNSS Conference participants		