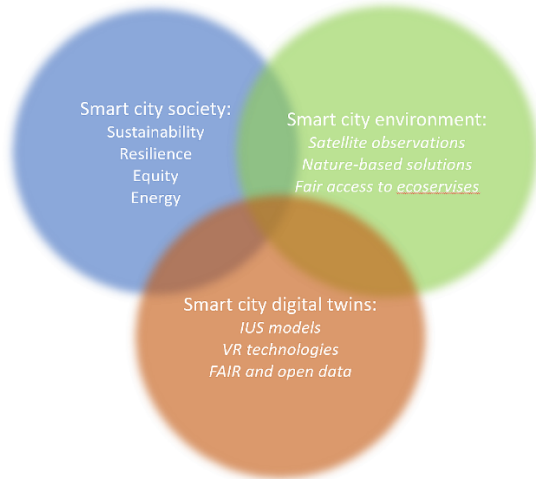




Socio-environmental interactions in sustainable smart cities

Young Scientist School (YSS) URSA MAJOR 2023

YSS-2023 Concept
Socio-environmental interactions in sustainable smart cities



The Young Scientist School (YSS) URSA MAJOR 2023 (**web-site**) will introduce a young generation of researchers to special topics in urban societal, environmental, and computational sciences. The focus is set on digital communications, massive environmental monitoring, and integrated urban system modeling to support sustainable development pathways in smart cities. Participants will learn about the current state-of-the-art, progress and challenges in urban system research; high-resolution climate modelling, observations (including ground-based and remote-sensing), and data analysis; as well as modern approaches to communication about socio-environmental interactions using web-based geoinformation systems, storytelling, and technologies of virtual and augmented reality.

The programme includes a series of conceptual theoretical lectures and concrete practical exercises. Each student will work in a group under a small-scale research project ending with online presentation to the school lecturers and participants and further with eventual peer-review research publication(s).

Timeline:

- October 23 (online session and material distribution)
- November 1-3 (in-person and hybrid sessions) in Tromsø (Sommarøy), Norway
- November 20 – 21 (online projects' defenses) and 24 (issue of certificates)

The School is a part of the Norwegian education and networking project URSA MAJOR. This School is supported by the Pan-Eurasian EXperiment (PEEX; <https://www.atm.helsinki.fi/peex>) and the World Meteorological Organization - Global Atmospheric Watch (WMO-GAW) communities.

This School is dedicated to the Memory of [Professor Sergej Zilitinkevich](#) (1936-2021), who has actively promoted atmospheric and environmental sciences, multi-disciplinary approaches in the Earth system modelling and their applications for research community, and especially, for the younger generation.

Expected audience: young Researchers, PostDocs, PhDs, MSc, advanced BSc. (20-30 participants in total)

The School will be organized in a hybrid format to increase knowledge transfer to participants unable to travel. All accepted participants of the school are required to attend a series of lectures and prepare small-scale research projects (SSRPs). Successfully defended SSRPs will be granted attendance certificates with 1-3 ECTS points as depending on quality and quantity of the presented results.

Table 1. Tentative YSS schedule and lectures

Time slots	October 23, 2023 Online Preparation Meeting	October 31, 2023 Arrival Day (Sommarøy)	November 1 st , 2023 (hybrid ¹)	November 2 nd (hybrid ¹)	November 3 rd (hybrid ¹)	November 20 th Online project defense (part 1)	November 21 st Online project defense (part 2)
Slot 1: 09:00 – 12:00			<p>A - Introduction to the school/welcome from organizers (L. H. Pettersson, NERSC)</p> <p>B - Organization of student groups (social/natural focus) (I. Esau, UiT)</p> <p>C – Introduction of Tools, Models, and Methods for Exercises (all responsible)</p> <p><u>Urban Sustainability Session</u></p> <p>Lecture “An overview of urban climate and sustainability at the North” (I. Esau, UiT)</p> <p>Lecture “An overview of urban sustainability in selected smart cities of Global South” (Ajith Joseph, NERCI)</p>	<p><u>Integrated Urban System Modelling Session</u></p> <p>Lecture “Integrated Urban System modeling” (A. Baklanov, WMO, in person)</p> <p>Lecture “Introduction to Extended and Virtual Reality technologies for urban applications” (S. Petersen, SINTEF)</p> <p><u>Demonstration (all)</u></p> <p>Virtual Reality enhanced visualization (S. Petersen, SINTEF)</p>	<p><u>Integrated Urban System Modelling Session (continues)</u></p> <p>Lecture “High-resolution urban modeling system PALM” (Ch. Mount, IMUK, online)</p> <p><u>Parallel Exercises:</u> (Turbulence line) Urban modeling with PALM (I. Ezau, UiT, in person; Ch. Mount, IMUK, online)</p> <p>(Natural line) Urban Integrated Modeling with Enviro-HIRLAM (R. Nuterman, UCPH in person; A. Mahura, UHel, online)</p> <p>(Social line) Multidisciplinary urban projects with examples from NTNU (A. Temeljotov-Salaj, NTNU)</p>	<p><u>Presentations:</u> (Turbulence line) Project #1</p> <p>(Natural line) Project #1</p> <p>(Social line) Project #1</p>	<p><u>Parallel Exercises:</u> (Turbulence line) Project #2</p> <p>(Natural line) Project #2</p> <p>(Social line) Project #2</p>
Slot 2: 13:00 – 16:00	<p>A - Summer school overview (I. Esau)</p> <p>B - Presentations of participants</p> <p>C - Distribution of tasks and materials for exercises (Turbulence line) (Natural line) (Social line)</p> <p>D – Questions and Answers</p>	<p>Arrival at Sommarøy Arctic Hotel</p> <p>Free time for students</p> <p>Closed URSA project meeting</p>	<p><u>Remote Sensing of Urban Environment Session</u></p> <p>Lecture “Urban nature-based solutions” (A. Temeljotov-Salaj, NTNU)</p> <p>Lecture “Remote sensing of urban environment” (V. Miles, NERSC)</p> <p><u>Intro Northern Norway</u> (a hiking tour or student presentations/discussions if weather will not permit)</p>	<p><u>Community Engagement Session</u></p> <p>Lecture “Community engagement in the Arctic cities” (M. Rozanova-Smith, GWU)</p> <p>Lecture “Smart cities and waste management: Implications for the informal waste economy in urban India.” (A. Luthra, GWU)</p> <p><u>Parallel Exercises:</u> (Turbulence line) An ideal energy-positive zero-emission municipality (I. Ezau et al., on, e.g., Utsyra, Longyearbyen, ZEB)</p> <p>(Natural line) Urban Integrated Modeling with Enviro-HIRLAM (R. Nuterman, UCPH in person; A. Mahura, UHel, online)</p> <p>(Social line) Multidisciplinary urban projects with examples</p>	<p>Departure from Sommarøy Arctic Hotel</p>		

				from NTNU (A. Temeljotov-Salaj, NTNU)			
Slot 3: 17:00 – 20:00		<p><u>Session in Memory of Sergej Zilitinkevich</u></p> <p>Lecture "WMO Urban Integrated Services for SSC" (A. Baklanov, WMO)</p> <p>Presentations (15 min):</p> <p>Ezau, I. "Implementation of S. Zilitinkevich works in models"</p> <p>Pettersson L. "Famous scientists – friends of the Nansen Center"</p> <p>Miles V. "Urban Web-storytelling"</p> <p>Bindu G. "Book presentation Powering cities in the global south"</p> <p>More TBD</p>	Ice breaking	<p><u>Community Engagement Session (continues)</u></p> <p>Lecture "Methods of digital knowledge co-production using arts, science, local and Indigenous ways of knowing" (V. Kuklina, GWU, online)</p> <p>Lecture "Climate change impact on urban infrastructure" (N. Shiklomanov, GWU, online)</p>			