

# 14<sup>th</sup> International Symposium on the Ordovician System

July 15–26, 2023; Estonia and Sweden

*in conjunction with*

The 3<sup>rd</sup> Annual Meeting of IGCP 735 and  
STRATI-2023 Ordovician Excursion



**14<sup>TH</sup> ISOS  
ESTONIA 2023**



## Third Circular & Programme

The 14<sup>th</sup> International Symposium on the Ordovician System will take place in Tallinn, Estonia, with field trips in Estonia and Sweden. ISOS-14 marks the return of the major event for all friends of the Ordovician System to Baltica after 41 years. Welcome to Estonia and Sweden in July 2023!

Tõnu Meidla and Olle Hints  
on behalf of the organisers

### General Schedule

July 14, 2023	Arrival to Tallinn
<b>July 15-18, 2023</b>	<b>Pre-conference excursion: Ordovician of Estonia</b>
July 18, 2023	Registration and Icebreaker in Tallinn
<b>July 19-21, 2023</b>	<b>Conference in Tallinn</b>
July 22, 2023	Travel from Tallinn to Uppsala, Sweden
<b>July 23-26, 2023</b>	<b>Post-conference excursion: Ordovician in Sweden</b>
July 27, 2023	Departure



REPUBLIC OF ESTONIA  
GEOLOGICAL SURVEY



## Programme day-by-day

Friday, July 14	<b>Arrival to Tallinn for the Pre-conference Excursion</b>
Saturday, July 15	<b>Pre-conference Excursion: Day 1</b> Ordovician in NW Estonia 8:30 Departure from TalTech (Ehitajate tee 5) 9:00 Departure from Tallinn University (Uus-Sadama 5) 18:00 Return to Tallinn
Sunday, July 16	<b>Pre-conference Excursion: Day 2</b> Ordovician in North Estonia 8:30 Departure from TalTech 9:00 Departure from Tallinn University 18:00 Return to Tallinn
Monday, July 17	<b>Pre-conference Excursion: Day 3</b> Ordovician in NE Estonia 8:30 Departure from TalTech 9:00 Departure from Tallinn University 18:00 Return to Tallinn
Tuesday, July 18	<b>Pre-conference Excursion: Day 4</b> Ordovician in NE Estonia 8:30 Departure from TalTech 9:00 Departure from Tallinn University 17:00 Return to Tallinn <b>Registration and Icebreaker</b> 14:00 Registration Desk open 18:00–21:00 Icebreaker
Wednesday, July 19	<b>Conference Day 1</b> 8:30 Registration Desk open 9:00–17:20 Scientific Sessions 17:30 Ordovician Subcommittee Business Meeting
Thursday, July 20	<b>Conference Day 2</b> 8:30 Registration Desk open 9:00–17:40 Scientific Sessions <b>IGCP Business Meeting</b> <b>Conference Dinner (starts at 19.00)</b>
Friday, July 21	<b>Conference Day 3</b> 8:30 Registration Desk Open 9:00–18:00 Scientific Sessions Closing Ceremony
Saturday, July 22	<b>Departure from Tallinn</b> <b>Arrival in Uppsala, Sweden, for Post-conference Excursion</b>
Sunday, July 23	<b>Post-conference excursion: Day 1</b> Ordovician in Västergötland, SW Sweden
Monday, July 24	<b>Post-conference excursion: Day 2</b> Ordovician in Västergötland, SW Sweden
Tuesday, July 25	<b>Post-conference excursion: Day 3</b> Ordovician in the Siljan district, central Sweden
Wednesday, July 26	<b>Post-conference excursion: Day 4</b> Ordovician in the Siljan district, central Sweden
Thursday, July 27	<b>Departure from Sweden</b>

## About Estonia

Estonia is located in northern Europe between Finland, Russia, Latvia and Sweden. With an area of 45,000 km<sup>2</sup> and a population of ca 1.3 million, it is one of the smallest countries in Europe. The official language is Estonian, a Fenno-Ugric language spoken by 1.1 million people.

Estonia is renowned for its economic and social freedom, sound education system, high level of digitisation and government e-services. The capital of Estonia is Tallinn, famous for its UNESCO World Heritage medieval old town. Tartu, the second largest city in the country, is best known for its university, established in 1632. Find out more at: <https://estonia.ee>, <https://www.visitestonia.com>.

Estonia is a member of the European Union, NATO, the OECD, and the Schengen Visa Area. We use euros (€), and card payments are accepted almost everywhere.

## To Tallinn

Tallinn can be reached from many European cities by direct flights or via nearby larger airports, particularly Helsinki, Stockholm and Riga. From Scandinavia and Central Europe, Estonia is also reachable by car or bus. For details, please consult: <https://www.visitestonia.com/en/travel-here-around/travel-to-estonia>

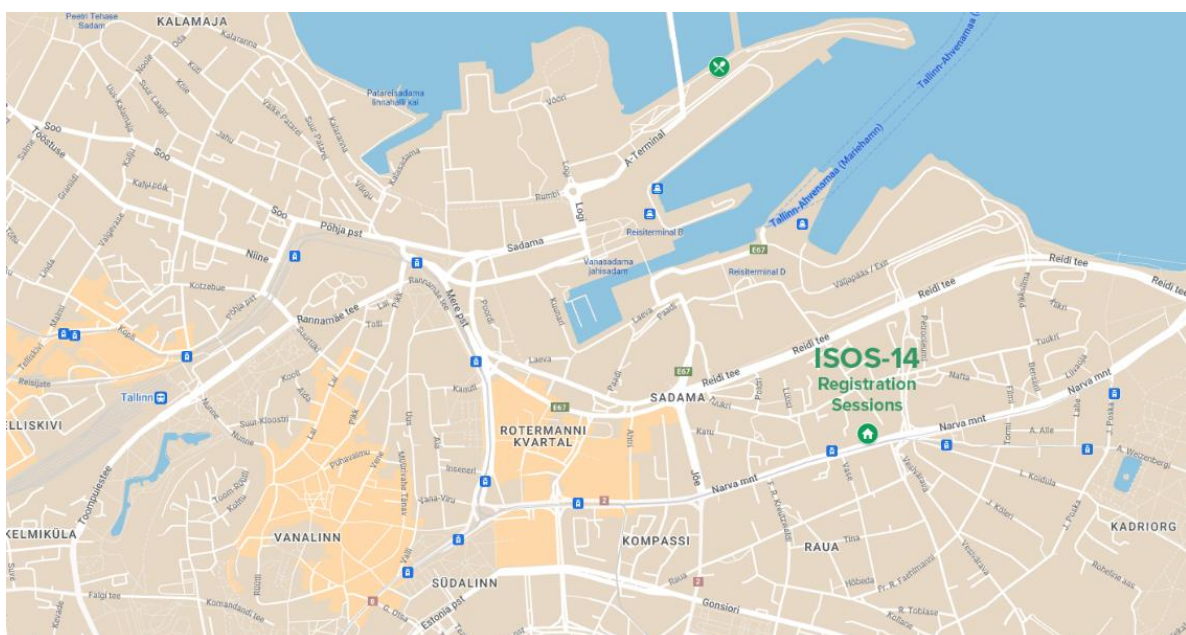
## Travel in Tallinn

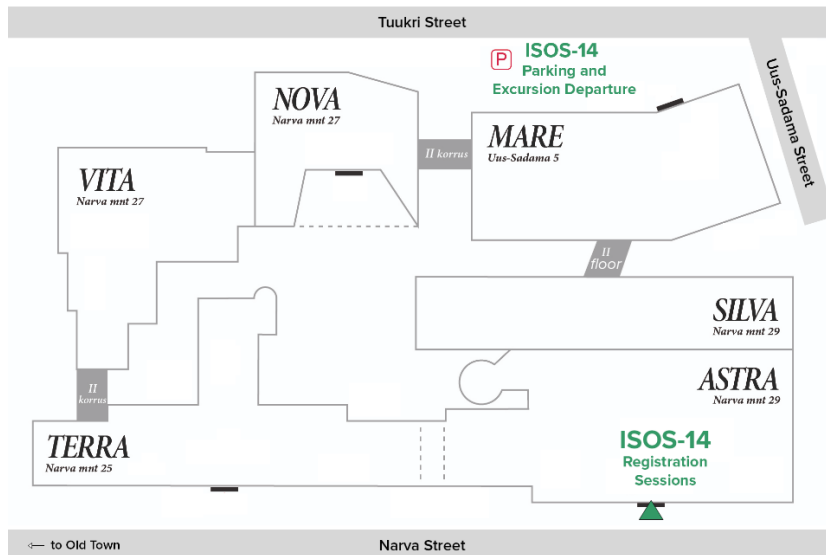
Generally, Tallinn has good public transport system (for downloadable maps, see <https://visittallinn.ee>). Bolt is a convenient taxi platform (download a mobile app: <https://bolt.eu/en-ee/>). Prices vary, but from the Airport to the City Center regular price would be 5-10 Euros.

**NB! Due to road construction in the city centre, some streets are closed and traffic jams may occur.**

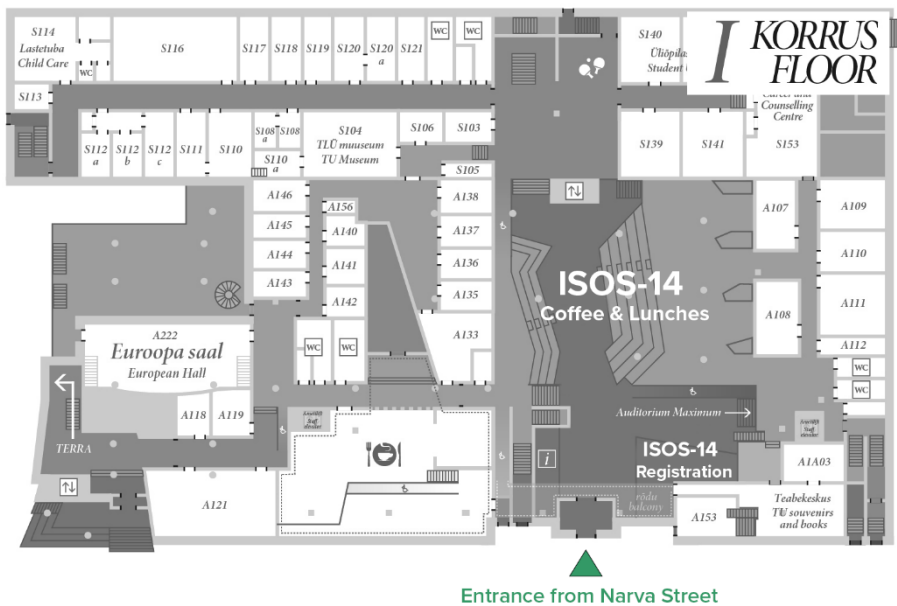
## Conference venue

The scientific sessions will take place at the Astra Building of Tallinn University, located in Tallinn City Centre (address: [Narva mnt 29](#)), within walking distance from the historic Old Town, hotels, restaurants, and the Baltic Sea.





## Tallinn University Astra/Silva Building, 29 Narva Street



## Accommodation

Various hotels and other types of accommodation are available in Tallinn, ranging from ca €50 to above €250 per room per night. Check, for instance, <https://booking.com> and <https://www.airbnb.com.ee>.

## Registration and Icebreaker

The registration desk at the conference venue, [Astra Building, Tallinn University, Narva mnt 29](#), Tallinn (check the maps above), will be opened at 14:00 on July 18, 2023. It will remain open throughout the scientific sessions.

The Icebreaker will take place at the same location ([Astra Building, Narva mnt 29](#)) from 18:00 to 21:00 on July 18, 2023.

## Conference Dinner

The conference dinner will take place at 19:00 on July 20, in Restaurant Ocean 11, located in the Port of Tallinn Cruise Terminal, [Logi 4/2](#) (within walking distance from the Conference Venue). Those who have paid the fee will receive a Dinner Coupon.

## Accompanying persons programme

Spouse activities are organised for the period of scientific sessions and, if necessary, during the field excursion. Please get in touch with Helle Pohl-Raidla ([helle.pohl-raidla@taltech.ee](mailto:helle.pohl-raidla@taltech.ee)) to tell her about your specific interests and wishes.

## Short papers and abstracts

The conference volume of short papers and abstracts has already been published in the [Estonian Journal of Earth Sciences](#), a Scopus-indexed Open Access journal. All contributions have a DOI identifier and are openly accessible on the journal website according to Creative Commons Attribution (CC BY) licence. Short papers are or will be, indexed in Google Scholar, Scopus and Web of Science.

The full conference volume (ca 100 MB) can be downloaded at: <https://kirjandus.geoloogia.info/reference/47403>

## Presentations

**Oral presentations** are limited to 20 minutes, and **keynote talks** to 40 minutes, including questions. Slides should be prepared in MS PowerPoint (.ppt, .pptx), pdf or Apple Keynote formats. It is advisable to also bring a pdf copy just in case. **NB! Please use a widescreen format (16:9) for your slides!**

**Presentation files** should be delivered to the organisers during on-site registration. Alternatively, send a link to your presentation (uploaded to a file-sharing service such as Google Drive, MS OneDrive, WeTransfer etc) via e-mail to: [isos14@ut.ee](mailto:isos14@ut.ee). Technical assistance will be available during

the sessions. Please let us know ASAP if you have any special needs regarding presentation software or file formats.

**Posters** will be displayed during the entire conference and presented during the poster session. Please prepare your poster in **A0 format**, in portrait orientation.

It is possible to have your poster printed in Tallinn and delivered to the conference venue by the organisers. Printing usually costs ca € 20, depending on speed and paper type. Please contact the printing office at the TalTech campus for further information and orders: [akadeemia@koopia.ee](mailto:akadeemia@koopia.ee).

NB! In case you would not like your slides or poster presentation to be photographed, please mark them clearly with the "No Photo" icon.

## Pre-conference excursion: Ordovician of Estonia (July 15-18)

The 4-days excursion will focus on the Ordovician succession of northern and central Estonia. **Please note that participants are responsible for arranging accommodation for the entire period of the excursion in Tallinn.**

The stops to be visited include coastal cliffs exposing the uppermost Cambrian to Upper Ordovician siliciclastics and limestones and active quarries and opencast mines for limestone and oil shale. Additionally, selected drill cores from central and southern Estonia piercing the entire Ordovician sequence will be shown at the Geological Survey's core repository and study facility.

Weather conditions during the excursion may vary from rainy 15°C to sunshine 30°C. It may be windy in coastal outcrops. Moderate walking (1 km) is planned at some stops. Rigid shoes are recommended.

More information and a map of the sites are available at <https://isos14.org/Excursions.html>

**Excursion bus will depart every day at 8.30 from TalTech main building ([Ehitajate tee 5, Tallinn](#)) parking lot and at 9.00 from the Tallinn University Mare building ([Uus-Sadama 5, Tallinn](#)) parking lot, located by the Tuukri Street, next to the conference venue (see the map above).**

### Schedule:

#### Day 1 (Saturday, July 15)

- Pakerort cliff, Pakri Peninsula (Cambrian to Early Ordovician siliciclastics)
- Uuga cliff, Pakri Peninsula (Floian to Darriwilian sandstones and limestones)
- Madise escarpment (Sandbian marly limestones)
- Põõsaspea cliff (Sandbian marly limestones, Kinnekulle K-bentonite)

#### Day 2 (Sunday, July 16)

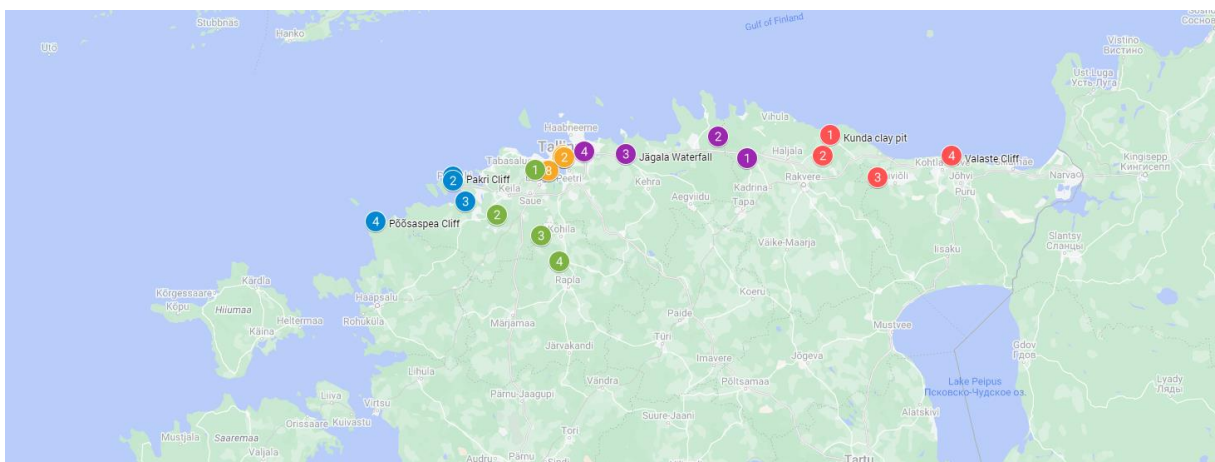
- Harku quarry (Darriwilian limestones)
- Vasalemma quarry (Sandbian-Katian limestones with organic build-ups)
- Sutlema quarry (Katian lime-mudstones)
- Reinu quarry (latest Katian to earliest Rhuddanian limestones)

### Day 3 (Monday, July 17)

- Optional: Kunda clay quarry (Terreneuvian clay)
- Kunda-Aru quarry (Darriwilian limestones)
- Põhja-Kiviõli opencast mine (Sandbian limestones and kukersite oil-shale)
- Ontika-Valaste cliff (Cambrian to Early Ordovician siliciclastics)

### Day 4 (Tuesday, July 18)

- Ordovician drill cores at the Arbavere Research Centre (full Ordovician succession from subsurface sections in NW, central and southern Estonia)
- Optional: Nõmmeveski riverbank (Tremadocian to Darriwilian siliciclastics and carbonates)
- Jägala waterfall (Tremadocian to Darriwilian siliciclastics and carbonates)
- Optional: Iru outcrop (Tremadocian sandstones with shelly phosphorite)



Latest Sandbian reefs in the Vasalemma quarry.



## Post-conference excursion: Ordovician in Sweden (July 23-26)

The 4-days excursion will focus on the Ordovician successions of Västergötland (southwest of Sweden) and the Siljan district (central Sweden). The excursion will start from Uppsala. Please note that participants are responsible for arranging accommodation for the night before the excursion (July 22 to 23) and the day/days following the excursion (from July 26 onwards). A variety of hotels and other types of accommodation is available at <https://booking.com> with a price range from €50 to €200 per night.

The field trip to Västergötland (two days) will include Mt Kinnekulle with the condensed Middle Ordovician limestone succession, and the Hirnantian at Mt Billingen. Some highlights in the Siljan District (two days) include type sections for several of the Swedish Ordovician units and the famous Boda Limestone carbonate mounds.

## Scientific Committee

- David A. T. Harper (Durham University)
- Lars Holmer (Uppsala University)
- Petr Kraft (Charles University)
- Thomas Servais (CNRS-Université de Lille)
- Zhan Renbin (Nanjing Institute of Geology and Palaeontology)

## Organising committee

- Tõnu Meidla, Chairman (University of Tartu)
- Olle Hints, Vice Chair (TalTech)
- Oive Tinn, Secretary (University of Tartu)
- Leho Ainsaar (University of Tartu)
- Tavo Ani (Geological Survey of Estonia)
- Markus Mäido (Geological Survey of Estonia)
- Peep Männik (TalTech)
- Helje Pärnaste (TalTech)
- Marko Kabel (Geological Survey of Estonia)
- Ursula Toom (TalTech)
- Karin Truuver (Estonian Museum of Natural History)
- Jan Ove R. Ebbestad (Museum of Evolution, Uppsala University, Sweden)



# Important numbers and locations

## E-mail and phone:

Website: <https://isos14.org>, general e-mail: [isos14@ut.ee](mailto:isos14@ut.ee)

- **Oive Tinn** (Conference Secretary): +372 53 33 15 56, [oive.tinn@ut.ee](mailto:oive.tinn@ut.ee)
- **Tõnu Meidla** (Chairman of the Organising Committee): +372 514 4504, [tonu.meidla@ut.ee](mailto:tonu.meidla@ut.ee)
- **Olle Hints** (pre-conference excursion): +372 51 30 157, [olle.hints@taltech.ee](mailto:olle.hints@taltech.ee)
- **Jan Ove Ebbestad** (post-conference excursion): [jan-ove.ebbestad@em.uu.se](mailto:jan-ove.ebbestad@em.uu.se)

The universal emergency number in Estonia and all of Europe is **112**.

## The conference venue, Registration and Icebreaker:

Astra Building of Tallinn University, Narva mnt 29, Tallinn

## Conference Dinner

Restaurant Ocean 11, Port of Tallinn Cruise Terminal, Logi 4/2, Tallinn

## Excursion departure

- The parking lot of Mare Building of Tallinn University, Uus-Sadama 5, Tallinn
- The parking lot of TalTech Main Building, Ehitajate tee 5, Tallinn

# Scientific Programme

## Wednesday, July 19, 2023



8:00	Registration desk open, hanging posters, uploading presentations etc.	
9:00	9:20	<b>Opening Ceremony</b>
<b>Session 1: Ordovician of the World</b>		
9:20	10:00	<b>David A.T. Harper</b> , Tõnu Meidla and Thomas Servais: The Ordovician System: From overlapping unit stratotypes to Global Stratotype Sections and Points ( <b>Keynote</b> )
10:00	10:20	Yong Yi Zhen and <b>Ian G. Percival</b> : Ordovician stratigraphy of the Junee–Narromine Volcanic Belt in central New South Wales, Australia: conodont studies and regional correlations
10:20	10:40	<b>Cristiana J.P. Esteves</b> , Patrick I. McLaughlin, Alyssa M. Bancroft, Thomas W. Wong Hearing, Mark Williams, Jahandar Ramezani, Poul Emsbo and Thijs R.A. Vandenbroucke: Upper Ordovician chronostratigraphic correlation between the Appalachian and Midcontinent basins
10:40	11:00	<b>Carolina Zabini</b> , Lívia Rodrigues, Fernando Lavié, Ana Beatriz Furtado Carvalho, Enrique Alberto Randolfe, Juan José Rustán, Francisco Arouca, Ana Laura Silva Gomes, Rodrigo Adórno, Matheus Denezine, Dermeval A. do Carmo and Mário L. Assine: A summary of the Brazilian Paraná Basin Ordovician
11:00	11:30	<b>COFFEE &amp; TEA</b>
<b>Session 2: Ordovician of Baltica</b>		
11:30	11:50	<b>Tõnu Meidla</b> , Leho Ainsaar, Olle Hints and Sigitas Radzevičius: Recent advances in the Ordovician stratigraphy of the Baltic Palaeobasin and Tornquist margin of Baltica
11:50	12:10	<b>Svend Stouge</b> , Gabriella Bagnoli, Carmen Bauert, Heikki Bauert and Christian M.Ø. Rasmussen: The detailed Middle to early Late Ordovician faunal succession and $\delta^{13}\text{C}_{\text{carb}}$ chemistry of the Kårehamn drill core, offshore eastern Öland, Sweden: implications for stratigraphy and correlation
12:10	12:30	<b>Tõnn Paiste</b> , Peep Männik, Svend Stouge and Tõnu Meidla: Towards a revised Sandbian conodont biozonation of Baltica
12:30	12:50	<b>Leho Ainsaar</b> and Tõnu Meidla: Age of the Ordovician sedimentary succession in Lumparn Bay, Åland Islands, Finland
12:50	13:10	<b>Andrej Ernst</b> : Ordovician Bryozoa of Estonia
13:10	14:00	<b>LUNCH</b>
<b>Session 3: Ordovician of China</b>		
14:00	14:40	<b>Yuandong Zhang</b> , Renbin Zhan, Yongyi Zhen, Wenhui Wang, Yan Liang, Xiang Fang, Rongchang Wu, Kui Yan, Junpeng Zhang and Wenjie Li: Ordovician geology and stratigraphy of China: A synthesis ( <b>Keynote</b> )
14:40	15:00	<b>Rongchang Wu</b> , Fangyi Gong, Mikael Calner, Jianbo Liu, Oliver Lehnert, Xiacong Luan, Guanzhou Yan, Lixia Li and Renbin Zhan: High-resolution carbon isotope stratigraphy of the Lower and Middle Ordovician succession of the Yangtze Platform, China
15:00	15:20	<b>Zhongyang Chen</b> , Wenjie Li, Xiang Fang, Chao Li, Clive Burrett, Mongkol Udchachon and Yuandong Zhang: Ordovician conodonts from the Ban Tha Kradan area, Western Thailand
15:20	15:40	<b>Qing Chen</b> and Linna Zhang: Biogeographic dynamics of graptolite species during the end Ordovician mass extinction in South China
15:40	16:20	<b>POSTERS, TEA &amp; COFFEE</b>
<b>Session 4: Regional aspects</b>		
16:20	16:40	<b>J. Javier Álvaro</b> and Blanca Martínez-Benítez: Advances in the Lower Ordovician of the western Iberian Chain, NE Spain
16:40	17:00	Sean Davis, <b>Frank R. Etensohn</b> and William M. Andrews: Using 3-D Mapping to understand an Upper Ordovician buildup and facies complex in the upper Lexington Limestone, central Kentucky, U.S.A.
17:00	17:20	<b>Björn Kröger</b> , Andrej Ernst, Amelia Penny, Hans Arne Nakrem and Ursula Toom: Diversity and spatial turnover of bryozoan assemblages in the reefs of the Vasalemma Formation (Late Ordovician), Estonia
17:20	<b>Ordovician Subcommittee Business Meeting and book presentation</b>	

## Thursday, July 20, 2023

8:30	Registration desk open, uploading presentations etc.	
<b>Session 5: Late Ordovician extinction</b>		
<b>9:00</b>	<b>9:40</b>	<b>Christian M.Ø. Rasmussen:</b> The Late Ordovician extinction conundrum ( <b>Keynote</b> )
9:40	10:00	<b>Audrey Morrison,</b> Amy Lefebvre, Ariel Van Patter, Alyssa Davis, Nigel Blamey, Jisuo Jin, Sylvia Riechelmann and Uwe Brand: Drivers of the Late Ordovician Mass Extinction: redox, volcanism, atmospheric oxygen/carbon dioxide and/or glaciation
10:00	10:20	<b>Patrick I. McLaughlin,</b> Thijs R.A. Vandenbroucke, Cristiana J.P. Esteves, Alyssa M. Bancroft, Timothy R. Paton, Carlton E. Brett, Mark Williams and Poul Emsbo: The late Katian Elkhorn event: precursor to the Late Ordovician mass extinction
10:20	10:40	<b>Joshua B. Zimmt,</b> Steven M. Holland, Mariko Cappello, David S. Jones, Jisuo Jin, Jon M. Husson, Blair Schoene, Charles Mitchell, Michael Melchin, Seth Finnegan and André Desrochers: An integrative biostratigraphic, chemostratigraphic, and sequence stratigraphic perspective of the Ordovician-Silurian boundary on Anticosti Island (Canada)
10:40	11:00	Olle Hints and <b>Petra Tonarová:</b> A diverse Hirnantian scolecodont assemblage from northern Estonia and resilience of polychaetes to the end-Ordovician mass extinction
11:00	11:30	<b>COFFEE &amp; TEA</b>
<b>Session 6: Basins, palaeogeography &amp; evolution</b>		
11:30	11:50	<b>Frank R. Ettensohn</b> and Gustavo Martins: Tectonic, foreland-basin origins of Upper Ordovician black gas shales in the Appalachian Basin of eastern United States
11:50	12:10	<b>Juwan Jeon,</b> Jeong-Hyun Lee, Stephen Kershaw, Zhong-Yang Chen, Jun-Ye Ma, Kun Liang and Yuan-Dong Zhang: The earliest known stromatoporoid and its contribution to reef construction
12:10	12:30	Fan Liu, Christian B. Skovsted, Timothy P. Topper, Yue Liang and <b>Zhifei Zhang:</b> The morphological disparity, ecological evolution and palaeobiogeography of Palaeozoic hyoliths
12:30	12:50	<b>Yan Kui,</b> Thomas Servais, Huang Bin, Li Jun and Shan Longlong: Global palaeogeographical implication of acritarchs in the Upper Ordovician
12:50	13:10	<b>Anna McGairy,</b> Christopher P. Stocker, Mark Williams, Phong Duc Nguyen, Thomas H. P. Harvey, Toshifumi Komatsu and Dayou Zhai: An Ordovician ostracod palaeopsychrosphere?
13:10	14:00	<b>LUNCH</b>
<b>Session 7: Ordovician palaeontology</b>		
14:00	14:20	<b>Jana Bruthansová,</b> Petr Kraft and Jirí Bruthans: Subway into the Ordovician (Prague Basin, Czech Republic)
14:20	14:40	<b>Petr Kraft</b> and Jana Bruthansová: Preservation of fossils in the Šárka Formation (Darriwilian, Czech Republic)
14:40	15:00	<b>Martina Aubrechtová</b> and Vojtech Turek: Three-dimensionally preserved siphuncle in an actinoceratid cephalopod from the late Katian of Bohemia
15:00	15:20	<b>Martina Nohejlová,</b> Christophe Dupichaud, Bertrand Lefebvre, Elise Nardin and Farid Saleh: Echinoderm Lagerstätten from high-latitude Gondwana – filling the gap in the Ordovician diversification of the phylum
15:20	15:40	<b>Mike Reich:</b> Where are all the Ordovician sea cucumbers (Echinodermata)?
15:40	16:20	<b>POSTERS, TEA &amp; COFFEE</b>
<b>Session 8: Ordovician brachiopods</b>		
16:20	16:40	<b>David A.T. Harper:</b> The Irish Ordovician brachiopod fauna: A taxonomic renaissance
16:40	17:00	<b>Lars E. Holmer,</b> Leonid E. Popov, Mansoureh Ghobadi Pour, Liang Yue and Zhifei Zhang: Siphonotretoid brachiopods - a thorny problem
17:00	17:20	<b>Yue Liang,</b> Luke C. Strotz, Timothy P. Topper, Lars E. Holmer, Graham E. Budd, Yanlong Chen, Ruisen Fana, Yazhou Hu and Zhifei Zhang: When lingulid brachiopods become infaunal(?) – perspectives from the morphological and anatomical information
17:20	17:40	<b>Jorge Colmenar,</b> Juan Carlos Gutiérrez-Marco and César Augusto Chacaltana: Lower-Middle Ordovician brachiopods from the Eastern Cordillera of Peru: biostratigraphical and palaeobiogeographical significance
17:40	<b>IGCP 735 Business Meeting</b>	
19:00	<b>Conference Dinner</b>	

## Friday, July 21, 2023

8:30	Registration desk open, uploading presentations etc.	
<b>Session 9: Ordovician palaeobotany and microfossils</b>		
<b>9:00</b>	<b>9:40</b>	<b>Paul K. Strother:</b> An evo-devo perspective on no Ordovician land plants ( <b>Keynote</b> )
9:40	10:00	<b>Charles H. Wellman,</b> Cameron R. Penn-Clarke, Claire Browning: Early land plant remains from the uppermost Ordovician-lowermost Silurian Cedarberg Formation of South Africa
10:00	10:20	<b>Claudia V. Rubinstein</b> and Vivi Vajda: Middle-Late Ordovician organic-walled phytoplankton from Sweden: diversity and early radiation
10:20	10:40	<b>Yan Liang,</b> Olle Hints, Jaak Nõlvak and Peng Tang: On future directions of Ordovician chitinozoan research
10:40	11:00	<b>Sonia Camina,</b> Olle Hints and Anthony Butcher: Chitinozoan nomenclature and databases
11:00	11:30	<b>COFFEE &amp; TEA</b>
<b>Session 10: GOBE</b>		
11:30	11:50	<b>Birger Schmitz</b> and Fredrik Terfelt: The breakup of the L-chondrite parent body 466 Ma and its terrestrial effects – a search for a mid-Ordovician biodiversity event
11:50	12:10	<b>Alycia L. Stigall,</b> Shaolin M. Censullo, Sarah A. Hennessey, Jennifer E. Bauer, Adriane R. Lam, and David F. Wright: Diversification and speciation among Laurentian brachiopods during the GOBE: insights from basinal and regional analyses
12:10	12:30	<b>M. Gabriela Mángano,</b> Luis A. Buatois, Beatriz G. Waisfeld, Diego F. Muñoz, N. Emilio Vaccari and Ricardo A. Astini: Trilobite expansion into estuarine environments during the Ordovician radiation
12:30	12:50	<b>Ernesto E. Vargas-Parra</b> and Melanie J. Hopkins: Phylogeny and evolutionary modularity of a trilobite family over the Ordovician radiation
12:50	13:10	<b>Luis A. Buatois,</b> M. Gabriela Mángano, Maximiliano Paz, Nicholas J. Minter and Kai Zhou: The ichnologic signature of deep-sea colonization during the Ordovician radiation
13:10	14:00	<b>LUNCH</b>
<b>Session 11: Isotopes and geochemistry</b>		
14:00	14:20	<b>Peep Männik,</b> Oliver Lehnert and Michael M. Joachimski: Ordovician climate changes in the northern subtropics: The $\delta^{18}\text{O}$ record from the Tunguska Basin, Siberia
14:20	14:40	<b>Alicja Wudarska,</b> Michael Wiedenbeck, Olle Hints, Peep Männik, Aivo Lepland, Michael M. Joachimski, Frédéric Couffignal, Maria Rosa Scicchitano and Franziska D.H. Wilke: Oxygen isotope compositions of conodonts – analytical challenges of in situ SIMS studies
14:40	15:00	<b>Imre Andreas Martin,</b> Leho Ainsaar and Aivo Lepland: Palaeozoic carbon isotope excursions and carbonate component analysis
15:00	15:20	<b>Mawo Ndiaye,</b> Merlin Liiv, Toivo Kallaste, Sophie Graul and Rutt Hints: Nitrogen and organic carbon isotope record in Tremadocian highly metalliferous black shales from Baltica
15:20	15:40	<b>Sophie Graul,</b> Toivo Kallaste, Marko Moilanen, Mawo Ndiaye and Rutt Hints: Early diagenetic transformation stages revealed by micro-analytical studies of shelly phosphorites, Rakvere Region
15:40	16:20	<b>POSTERS, TEA &amp; COFFEE</b>
<b>Session 12: Events, faunas and scientometrics</b>		
16:20	16:40	<b>Timothy Paton,</b> Patrick McLaughlin, Poul Emsbo, Thijs R.A. Vandenbroucke and Carlton Brett: Upper Ordovician hardgrounds - from localized surfaces to global biogeochemical events
16:40	17:00	<b>Ursula Toom,</b> Jukka Kuva and Dirk Knaust: Ichnogenus <i>Trypanites</i> in the Ordovician of Estonia (Baltica)
17:00	17:20	<b>Lixia Li</b> and <b>Joachim Reitner:</b> A remarkable new halichondrid demosponge, <i>Ptilospongia hemisphaeroidalis</i> , from the latest Ordovician Beigong Biota, South China
17:20	17:40	<b>Yukio Isozaki:</b> Coupled extinction-regression episodes revisited in mid-oceanic settings for comparative extinction study during the Palaeozoic in view of non-bolide extraterrestrial causes
17:40	18:00	Alysson Mazoni, Rodrigo Costas and <b>Carolina Zabini:</b> Ordovician scientometrics
18:00	<b>Closing Ceremony</b>	

# Poster Presentations

1. **Mariana Vilela de Andrade** and Alycia L. Stigall: Developing a phylogenetic framework for tiny Ordovician brachiopods (Atrypida: Anazyginae and Catazyginae) from the eastern United States
2. Galyna Anfimova and **Volodymyr Grytsenko**: The Ordovician collections stored at the National Museum of Natural History NAS of Ukraine
3. **Jana Bruthansová** and Petr Kraft: Ordovician conulariid monospecific assemblages (Czech Republic, Morocco)
4. **Gisella M. Della Costa** and Guillermo L. Albanesi: The Evae transgression: A major event?
5. **Liting Deng**, Ming Li and Mo Huang: Darriwilian (Middle Ordovician) graptolites from northern margin of the Qaidam Basin (Qinghai, China)
6. Christophe Dupichaud, **Bertrand Lefebvre** and Martina Nohejlová: Solutan echinoderms from the Lower Ordovician of the Montagne Noire (France): new data and palaeobiogeographic implications
7. **Rao Fu**, Yue Liang, Lars E. Holmer, Yutong Lu, Yi Xiang, Yazhou Hu and Zhifei Zhang: Late Ordovician gastropods from the Zhaolaoyu Formation in the southwestern margin of the North China Platform
8. **Pauline Guesner**, Martina Nohejlová, Elise Nardin and Bertrand Lefebvre: A methodological scheme to analyse the early Palaeozoic biodiversification with the example of echinoderms
9. **Linda Hints** and Jaak Nõlvak: Latest Sandbian brachiopods and chitinozoan biostratigraphy in North Estonia
10. Yazhou Hu, Luke C. Strotz, Dirk Knaust, Jiayue Wang, Yue Liang and **Zhifei Zhang**: Distinguishing borings and burrows in intraclasts
11. Ming Li, Pengju Liu, Lixia Li and **Liting Deng**: Tremadocian (Ordovician) reclined graptolites from Baishan, North China
12. Qijian Li, Lin Na, Shenyang Yu, **Oliver Lehnert**, Axel Munneck and Yue La: Late Ordovician beachrock as a far-field indicator for glacial meltwater pulse
13. **Fernando E. Lopez**, Gladys Ortega, Guillermo L. Albanesi and Aldo L. Banchig: New contributions to the Ordovician biostratigraphy of the Western Precordillera, Argentina
14. **Monika Luptáková** and Petr Kraft: Impoverished fossil association in the lowermost Sandbian of the Prague Basin (Czech Republic)
15. **Peep Männik** and Jaak Nõlvak: Boundary between the Porkuni and Juuru regional stages in the Neitla section, Estonia
16. **Tõnu Meidla**, Olle Hints and Leho Ainsaar: Searching for the Ordovician-Silurian boundary in Estonia, Latvia and Lithuania
17. Lucy A Muir and **Juan Carlos Gutiérrez-Marco**: A new species of the problematic organism *Webbyites* from the Early Ordovician Fezouata Biota of Morocco
18. Johann Müller, Michael Joachimski, **Oliver Lehnert**, Peep Männik and Yadong Sun: Changes in shelf phosphorus burial during the Hirnantian glaciation and its implications
19. **Jaak Nõlvak**, Yan Liang and Olle Hints: Latest Ordovician age of the *Spinachitina fragilis* Chitinozoan Biozone in Baltoscandia
20. **Helje Pärnaste**, Ursula Toom and Leonid Popov: The earliest Ordovician trace fossils *Cruziana* and *Rusophycus* from Baltica
21. Maxime Renaud, **Bertrand Lefebvre**, Denis Bailliot, Marie-Noëlle Bailliot, Sophie Coat, Christian Gaudu and Muriel Vidal: First report of the mitrate *Mitrocystella* (Echinodermata, Stylophora) in the Middle Ordovician of the Crozon Peninsula, Brittany (France)
22. Dulce Raquel Reyes-Montoya, Francisco Javier Cuen-Romero, Pilar Navas-Parejo, Nohemí Gámez-Meza, Juan José Palafox-Reyes and **Juan Carlos Gutiérrez-Marco**: Early Tremadocian graptolites from the Arivechi area, Sonora, northern Mexico
23. **Petra Tonarová**, Thomas J. Suttner, Michal Kubajko and Olle Hints: Late Ordovician jawed polychaete fauna from Spiti Valley, northern India
24. **Olev Vinn**, Kenneth De Baets, Mare Isakar and Ursula Toom: Parasite-induced shell damage in brachiopod *Porambonites* (*Porambonites*) *laticaudata* from the Late Ordovician (Sandbian) of Estonia
25. **Chuanshang Wang** and Yong Hu: Distribution pattern of the Ordovician black shale constrained by graptolite zonation in the western margin of the Ordos Block, North-West China
26. **Zhifei Zhang**, Yue Liang, Fan Liu and Yazhou Hu: Reconstruction of the first animal consumer-driven marine ecosystem on Earth, perspectives from early Cambrian small skeletal fossils from China