# SECOND CIRCULAR



# **ISSS Meeting 2025**

"Advances in Silurian chronostratigraphy and highresolution correlation"

Seville, Spain, 10<sup>th</sup>–13<sup>th</sup> September 2025







#### **ISSS Meeting 2025: SECOND CIRCULAR**

The official 2025 meeting of the International Subcommission on Silurian Stratigraphy will take place in Spain, as agreed by the delegates at the last annual meeting held in Sofia, Bulgaria, in September 2024.

This year marks the 27<sup>th</sup> anniversary of the Silurian Field Meeting that took place in Spain and Portugal in June 1998, which also visited the outcrops in northern Seville. In 2025, coinciding with the meeting, the *Golden Spike* marking the replacement Global Stratotype Section and Point (GSSP) of the Telychian Stage of the Llandovery Series will be officially established there.

Seville is a fitting location for a Silurian meeting due to its special significance in Spanish history, its status as a very pleasant city full of colour and tourist attractions, and, of course, its proximity to the most complete, continuous and fossiliferous Silurian sections in Spain. These sections are located in the Ossa-Morena Zone of the Iberian Massif, within the Natural Park and UNESCO Global Geopark Sierra Morena de Sevilla, an area of great scenic, geological, and cultural value.

The Silurian rocks of Seville have attracted geological studies since the late 19<sup>th</sup> century. However, it was not until the 1970s that the discoveries of the distinguished French geologist Michel Robardet initiated a series of investigations into their exceptional stratigraphy and fossil record, making the region a model area for Silurian studies.

Seville and its Silurian strata welcome you in September 2025!

Juan Carlos Gutiérrez-Marco and Sara Romero On behalf of the organisers

#### **Schedule and Deadlines**

Due to the proximity of the meeting dates, an almost immediate response to the questionnaire at the end of this circular is required.

June 30 <sup>th</sup>	Deadline for paying the regular fee	
July 1 <sup>st</sup>	Deadline for short papers and abstracts	
July 30 <sup>th</sup>	Distribution of the Third Circular with the Final Programme	
September 9 <sup>th</sup>	Arrival in Seville	
September 10 <sup>th</sup> –11 <sup>th</sup>	Scientific sessions, official dinner	
September 12 <sup>th</sup>	Silurian Excursion and Golden Spike ceremony of the base of	
September 12	Telychian replacement GSSP	
September 13 <sup>th</sup>	ember 13 <sup>th</sup> Optional excursion to the Silurian of the North of Seville	
September 14 <sup>th</sup>	Departures from Seville	

#### **About Seville**

Seville (Sevilla in Spanish) is the capital and largest city of the Spanish autonomous community of Andalusia and the province of Seville. It is situated on the lower reaches of the River Guadalquivir, in the southwest of the Iberian Peninsula. It has a municipal population of about 701,000 and a metropolitan population of about 1.5 million, making it the largest city in Andalusia and the fourth-largest city in Spain. The Seville harbour,

located about 80 kilometres (50 miles) from the Atlantic Ocean, is the only river port in Spain.

The capital of Andalusia experiences high temperatures in summer, with daily maximums routinely above 35°C (95°F) in July and August, and slightly lower in September (mean daily maximum 26.3°C, mean daily minimum 18.4°C, percentage of possible sunshine 70, average precipitation days 2.8 mm). Find out more at: <a href="https://www.spain.info/en/destination/seville/">https://wisitasevilla.es/en/</a>

### Travel

Seville Airport (IATA: SVQ, ICAO: LEZL), also known as San Pablo Airport, is a large airport in Spain that has non-stop passenger flights scheduled to 83 destinations in 21 countries. In total, there are 23 airlines operating flights to and from Seville. Find out more at: <a href="https://www.flightconnections.com/flights-from-seville-svq">https://www.flightconnections.com/flights-from-seville-svq</a>

The connection to Seville via Madrid can be made by domestic flight or, if you wish to take advantage of your trip to visit the Spanish capital, there is a connection with Seville via high-speed trains that usually depart daily around 06:00, while the last service is around 21:00, providing great schedule flexibility. The Madrid–Seville journey takes about 2 hours and 30 minutes, with trains departing from Atocha station in Madrid and arriving at Seville Santa Justa station. In addition to Renfe's AVE trains (<a href="https://www.renfe.com/es/en">https://www.renfe.com/es/en</a>), options like Iryo, OUIGO, and AVLO offer competitive prices and frequencies that complement the journey. Remember that you can find cheap train tickets from Madrid to Seville if you book in advance or take advantage of special offers.

Please check if you need a visa for the Schengen Area and contact the organisers in advance should you require an official invitation.

#### Accommodation

Conference participants are responsible for arranging accommodation for the entire period of stay, including post-conference excursions.

A variety of hotels and Airbnb rooms/apartments are available, with an estimated total price per person for 5 nights (check-in Tuesday 9<sup>th</sup>, check-out Sunday 14<sup>th</sup>) ranging between 450–750 €in hotels and 270–570 €in tourist apartments. Prices vary depending on how early you book and the type of accommodation you choose, but generally, you can find cheaper alternatives if you book in advance or take advantage of special offers.

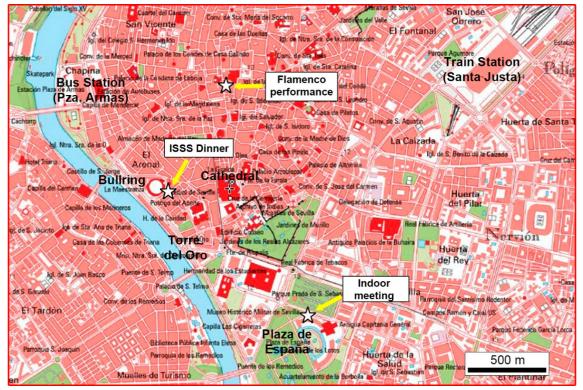
As a safety measure, try to avoid accommodation in the area of Seville known as "Las Tres Mil (3000) Viviendas" (southeast of the city centre).

#### Conference venue

The scientific sessions will be held at a central location in Seville, near the Plaza de España and within walking distance of the historic Old Town — a UNESCO World Heritage Site comprising three notable landmarks: the Alcázar palace complex (11<sup>th</sup>–14<sup>th</sup> centuries), the Gothic Cathedral (which incorporates elements of the 12<sup>th</sup>-century Almohad mosque) and the General Archive of the Indies. Another nearby point of interest is the Torre del Oro ('Tower of Gold'), a dodecagonal military watchtower builth in the first third of the 13<sup>th</sup> century.

The attached maps show the location of the main venues involved in the meeting, as well as the area of the excursions to the northeast of Seville.





# Fees and payment

	Early bird payment (until June 30 <sup>th</sup> )	Payment of the fee after June 30 <sup>th</sup> , 2025
Senior researcher	300 €	350 €
Accompanying person	120 €	150 €
Subcommission Dinner Thursday 11 <sup>th</sup>	50 €	50 €
Optional field trip Saturday 13 <sup>th</sup>	95 €	120 €

The registration fee will include: admission to all sessions, workshop, conference programme and excursion guide, publication in the conference volume, snacks and coffee breaks as scheduled, social events, and the Silurian Field Trip on Friday, 12<sup>th</sup> September (*Golden Spike* ceremony).

The accompanying person fee includes attendance at the social events and the excursion on Friday, 12<sup>th</sup> September.

Bank transfer payments are preferred, in accordance with the instructions specified in the registration form. Please remember to include the keyword 'REUNION SILURICO+' along with the name(s) of the participant(s) in the payment description, and ensure that the transfer is made without any charges to the beneficiary.

For paying the early bird conference fee, SEDPGYM will issue invoices on request.

After paying the fees, you will receive an email from the treasurer to confirm your registration once payment is settled.

Cancellation notice: Refunds of 50% of the conference and excursion fees will be granted if the cancellation is received before 20<sup>th</sup> July 2025. No refunds will be possible after this date. In the unlikely event of cancellation or postponement of the meeting due to an unexpected war or global health crisis, the fees will be refunded.

## **Support**

Very limited support covering the registration expenses for early career researchers from the ISSS may be available; please contact the ISSS chairman prof. Carlo Corradini (ccorradini@units.it) for further details. Note that only participants with presentations will be considered for support.

# **Registration and Icebreaker**

The registration desk will be open at the conference venue on the morning of 10<sup>th</sup> September 2025. An informal "icebreaker party" will be held for interested participants at a *tapas bar* in the centre of Seville, serving as a meeting point in the late evening of Tuesday 9<sup>th</sup> September. As this is an optional event, each person will cover their own expenses. The chosen place will be indicated in the final circular.

# **Conference Dinner and Activities for Accompanying Persons**

The conference dinner will take place on Thursday, 11<sup>th</sup> September, at a restaurant adjacent to the bullring (Real Maestranza de Sevilla) — see map. The name and address of the venue will also be provided in the final circular. Please note that the Conference Dinner is *not included* in the registration fee.

The activities for accompanying persons, covered by their specific fee, include a flamenco performance on the evening of 11<sup>th</sup> September and the full-day excursion on Friday, 12<sup>th</sup> September. Professional contacts for guided tours in Seville, or visits to the nearby Roman ruins of *Italica* (birthplace of Roman Emperor Hadrian), will be made available upon request.

# Short papers and abstracts

Submission deadline: 1<sup>st</sup> July 2025. Single page to extended (just up to ten pages) abstracts will be published at the time of the meeting in the *Palaeontological Publications* Series (free open access, with no article processing charges) of the Spanish Palaeontological Society. See example of a similar meeting in:

#### https://sepaleontologia.es/palaeontological-publications-series/

Contributions must be formatted according to the guidelines provided in the attached template. Please send your abstract to: <a href="mailto:sarome01@ucm.es">sarome01@ucm.es</a> Submissions received after 1<sup>st</sup> July, will *not* be published.

All abstracts submitted to the meeting will be reviewed by the Scientific Committee and may be rejected if not complying with the meeting's topics and/or if the content doesn't reach a minimum standard quality.

Following the meeting, facilities will be provided for those participants wishing to publish their contributions in full in a Spanish scientific journal indexed in international rankings.

#### **Presentations**

Depending on the final numbers, regular oral presentations will be limited to either 10+5 or 15+5 minutes. Slides should be prepared in MS PowerPoint (.ppt, .pptx) or PDF formats.

Posters in vertical A0 size will be displayed throughout the entire meeting and presented during the poster sessions.

# Workshop on Silurian Age-Depth Modelling

Coordinated by Emilia Jarochowska, Niklas Hohmann and the MindTheGap team, Utrecht University and the Netherlands eScience Center

### Workshop description

Age-depth models are crucial to determine the timing and pace of past changes and events. They formalize stratigraphical hypotheses, thus allowing application of the hypothetico-deductive approach to the reading of the geological record. Multiple packages are available to construct age-depth models from stratigraphical data, allowing for a quick and reproducible estimation of age-depth relationships. However, most packages rely on assumptions that are best suited for specific depositional environments or type of stratigraphical data and cannot be treated as universal. In particular, most have been developed and validated on Neogene datasets. Deep-time, Palaeozoic stratigraphical data are more sparse and require a dedicated approach.

This workshop is an introduction to age-depth modeling for Silurian case studies with two versatile R packages "admtools" and "BChron". The packages provide a combination that should prove suitable for a very wide range of Palaeozoic studies. BChron is a Bayesian method originally developed for Quaternary records based on a specified accumulation model, while admtools provides two nonparametric methods to estimate age-depth models from stratigraphical and sedimentological expert knowledge such as (semi-quantitative) constraints on sedimentation rates or tracer fluxes. We focus on computing age uncertainty from the age-depth models, propagating this uncertainty into interpretation of proxy records, and the discussion of model assumptions and their influence on uncertainties.

At the end of the workshop, participants will be able to decide which method is most suitable for their respective records, independently construct age-depth models from their data, and propagate age-uncertainties into downstream analyses. Interested participants are encouraged to bring their own datasets to the meeting or to contact the workshop leader, Emilia Jarochowska (e.b.jarochowska@uu.nl) to discuss how age-depth modelling can be applied to their studies.

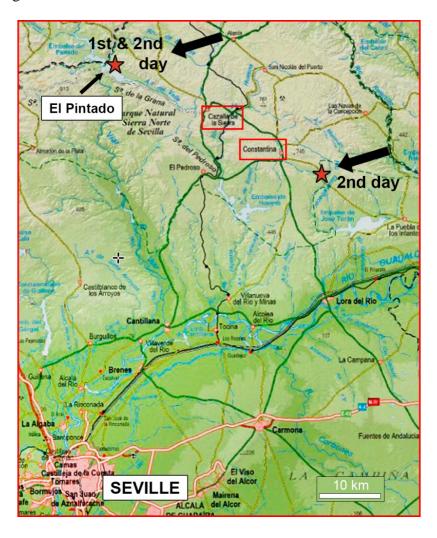
## Prerequisites

Participants should bring their own laptops with an up to date version of R Software and RStudio installed. For those not familiar with R we recommend going through an introductory course (e.g., <a href="https://utrechtuniversity.github.io/workshop-introduction-to-R-and-data/">https://utrechtuniversity.github.io/workshop-introduction-to-R-and-data/</a> at least until chapter 11). Participants must be familiar with basic usage of RStudio to install packages, execute scripts, and load data.

The focus of the workshop will be the concepts underlying age-depth modeling, and not programming in R. We will provide all R scripts to focus on the scientific contents rather than the programming language. However, familiarity with R syntax will improve the learning experience.

#### **Excursions**

Two Silurian field trips to the Natural Park and UNESCO Global Geopark Sierra Morena de Sevilla will complement the indoor sessions. Due to the access conditions to the Silurian outcrops (dirt roads with a limited turning radius), a standard coach cannot be used, and the number of seats is limited to 30 people, with preference given to the officers and titular members of the Silurian Subcommission/ICS. The remaining places will be allocated in order of registration and will only be secured if the fee is paid before 15<sup>th</sup> June 2025. If the number of registrations slightly exceeds the available places, one of the collaborating entities may accommodate the excess participants by transporting them in their own official vehicles. Both excursions are full-day trips, departing from and returning to Seville.



# Friday 12th – El Pintado and Golden Spike ceremony for the Telychian (included in the registration fee)

The first field trip (Friday 12<sup>th</sup>, from 08:30 to 20:30) is dedicated to the El Pintado-1 section in the Valle Syncline, north of Seville. It is an integral part of the activities of the Silurian meeting and is included in the registration fee. The section consists of a largely undeformed, graptolitic succession ranging from the basal Rhuddanian to close to the Ludlow/ Přídolí boundary, with a stratigraphical thickness exceeding 120 metres. In the lower 64 metres of the succession, more than 200 different graptolite species have been identified. The four standard graptolite biozones of the Rhuddanian are recognised, while the Aeronian is represented by five graptolite biozones, showing a gap in sedimentation spanning the upper *triangulatus*—lower *leptotheca* biozones and probably another, shorter gap in the *sedgwickii* Biozone. From the Telychian, only the graptolites of its basal part have been studied (guerichi and lower turriculatus biozones). The remaining Telychian strata, as well as the Wenlock, Ludlow, and Přídolí parts of the section, have not yet been studied in detail, but they will also be examined during the excursion. This includes the only two limestone beds in the upper half of the succession: the thin Ludlow "Orthocerathid limestone" and the mostly Přídolí "Scyphocrinites limestone." On the morning of the excursion, the Golden Spike ceremony will take place, marking the replacement Global Stratotype Section and Point (GSSP) of the Telychian Stage, with the attendance of various national, regional, and local authorities. For more information see: https://doi.org/10.18814/epiiugs/2025/025009

# Saturday 13th – Cerrón del Hornillo Syncline (Optional - NOT included in the registration fee)

The second field trip (Saturday 13<sup>th</sup>, from 08:30 to 20:30) is optional and aims to visit a Ludlow outcrop in the Cerrón del Hornillo Syncline, where we will also visit other Cambrian or Ordovician geosites of the Geopark. We will then return to the Valle Syncline to complete the study of sections not visited the previous day, particularly one concerning the Wenlock/Ludlow boundary, which was published in 1996.

#### Scientific committee

Carlo Corradini, chairman (University of Trieste, Italy)
Bing Huang (NIGPAS, China)
Bradley D. Cramer (University of Iowa, USA)
Annalisa Ferretti (University of Modena, Italy)
Emilia Jarochowska (Utrecht University, The Netherlands)
Anna Kozłowska (Institute of Paleobiology PAS, Poland)
David K. Loydell (University of Portsmouth, UK)
Jörg Maletz (Freie Universität Berlin, Germany)
Tõnu Meidla (University of Tartu, Estonia)
Mike J. Melchin (St. Francis Xavier University, Canada)
José Manuel Piçarra (LNEG, Portugal)
Vincent Perrier (Université Claude Bernard Lyon 1, France)
David C. Ray (University of Birmingham, UK)

Artur A. Sá (University of Trás-os-Montes e Alto Douro, Portugal) Valeri Sachanski (Geological Institute BAS, Bulgaria) Ladislav Slavík (Institute of Geology CAS, Czech Republic) Petr Štorch (Institute of Geology CAS, Czech Republic) Zhang Yuandong (NIGPAS, China)

# **Organizing committee**

Juan Carlos Gutiérrez-Marco, chairman (Spanish Research Council – IGEO)
Sara Romero, secretary and scientific editor (Complutense University, Madrid)
Isabel Rábano, treasurer (Spanish Research Council – IGME)
Fernando Ruiz Bermudo (Spanish Research Council – IGME)
Saturnino Lorenzo Álvarez (University of Castilla-La Mancha, Spain)
Vicente Castaño Torres (Sierra Morena de Sevilla UNESCO Global Geopark)
Gonzalo Fernández de Castro Martínez (Sierra Morena de Sevilla UNESCO Global Geopark)

# Sponsored by

- Instituto de Geociencias CSIC-UCM-MICIU/Institute of Geosciences-IGEO
- Natural Park and UNESCO Global Geopark Sierra Morena de Sevilla, Junta de Andalucía (Andalusian Government)
- Centro Nacional Instituto Geológico y Minero de España-CSIC-MICIU/Spanish Geological and Mining Institute-IGME
- Asociación de Geólogos y Geofísicos Españoles del Petróleo—
   AGGEP/Association of Spanish Petroleum Geologists and Geophysicists
- Confederación Hidrográfica del Guadalquivir–MITECO/Guadalquivir River Hydrographic Confederation
- Sociedad Española para la Defensa del Patrimonio Geológico y Minero—
   SEDPGYM/Spanish Society for the Defense of Geological and Mining Heritage
- Sociedad Española de Paleontología SEP/Spanish Palaeontological Society

#### **Contact and further information**

Website (provisional):

https://silurian.stratigraphy.org/meetings

E-mail and phone:

**Sara Romero** (conference secretary): phone/whatsapp +34 689 274 108, sarome01@ucm.es

**Juan Carlos Gutiérrez-Marco** (chairman of organizing committee): phone +34 676 933 499, icgrapto@ucm.es

**Isabel Rábano** (treasurer): phone/whatsapp +34 699 232 550, i.rabano@igme.es

# **Summary of Provisional Schedule**

	PRELIMINARY PROGRAMME			
	WEDNESDAY 10th	THURSDAY 11th	FRIDAY 12th	SATURDAY 13th
8:30-9:00	Registration			7
9:00-9:30	Opening	ANDRES ANDRESS LAS		
9:30-10:00	Inaugural lecture: Telychian GSSP	Oral Sessions		Optional field trip
10:00-11:00	Oral Sessions	Dispersion of Action Control of C	SILURIAN FIELD TRIP	to the Silurian
11:00-11:30	Coffee Break + Poster Session	Coffee Break + Poster Session	The Golden Spike ceremony	outcrops of the Valle
11:30-12:30	Oral Sessions	Business Meeting ISSS	for the new Telychian GSSP	and Cerrón del
12:30-13:30	Olai Sessiolis	Busiless Meeting 1555	at El Pintado 1 section	Hornillo synclines
13:30-15:00	Lunch	Lunch	(Cazalla de la Sierra) + Silurian	
15:00-16:00	Oral Sessions	ACCAMINE MARKINE	outcrops of the Valle syncline	Sevilla UNESCO
16:00-17:00	Olai Sessions	Workshop on	(Rhuddanian to Pridoli)	Global Geopark
17:00-17:30	Coffee Break + Poster Session	Silurian Age-Depth Modelling	10.000 (0.000 (0.000 (0.000)	Global Geopaik
17:30-18:00			(picnic lunch)	(picnic lunch)
18:00-18:30	Oral Sessions	Poster Session		(picinic lunch)
18:30-19:00	Ciai Sessions		ľ	
19:00-19:30	i			<u>U</u>
19:30-20:30		Flamenco Spectacle		

See you in Seville!

# **ISSS Meeting 2025** Seville, Spain, 10<sup>th</sup>–13<sup>th</sup> September 2025

### **REGISTRATION FORM**

(deadline for early birth payment: 1st July, 2025)

Title, Name, Surname:		
Institution:		
Address:		
E		
E-mail:		
Registration fees:		
Full participation (10 <sup>th</sup> –12 <sup>th</sup> September),	300 €	
Accompanying person(s), $\leq 120 \text{ x (number)}$	€	
Subcommission Dinner (11 <sup>th</sup> September), €0 x (number)		
Optional excursion (13 <sup>th</sup> September), €5 x (number)	€	
	TOTAL:€	
Attendance at the planned workshop (own laptop required $\square$ Yes $\square$ No	l):	
Specific dietary requirements:		
□ Yes □ No		
If yes, please specify:		
Do you require an official invoice for the registration payn		
Yes No	iciit.	
If yes, please provide the name of the recipient and VAT num	ber:	
Payments must be made by bank transfer to the following Account holder: SEDPGYM	account:	
Bank: CaixaEnginyers (CajaIngenieros), Spain.		
<b>Bank account n° (IBAN)</b> : ES09 3025 0006 2914 3322 6827		
<b>SWIFT/BIC</b> : CDENESBBXXX Please include <i>REUNION SILURICO</i> +your surname in the pa	vment reference and	

ensure that **no charges are applied to the beneficiary**.

**Important:** Please send both the completed registration form and a copy of the bank transfer receipt by e-mail to: i.rabano@igme.es

## (Abstract template) CONCISE TITLE IN CAPITALS, ARIAL FONT SIZE 12

Full Name<sup>1,2\*</sup>, Full Name<sup>2</sup> and Full Name<sup>1</sup> (font size 11)

**Keywords**: keyword 1, keyword 2, max. 6 keywords. (font size 11)

#### MAIN TEXT HERE

Abstracts must not exceed a maximum of ten printed A4 pages (inclusive of text, figures, tables, acknowledgements, and references), with fully justified margins of 2 cm on all four sides. The text should be formatted in Arial, font size 11, with single line spacing.

Where appropriate, the body of the text may be structured using a maximum of two levels of headings: **first-order headings in bold CAPITAL LETTERS**, and **second-order headings in bold lowercase letters**. Headings (e.g., *Introduction, Discussion, Conclusions*) should not be preceded by numerals or letters.

Please use either British or American English spelling consistently throughout the manuscript—do not mix both variants.

References cited within the text and in figure captions must follow the format exemplified below: Štorch (1988), Štorch *et al.* (1989), (Loydell, 2023; Štorch and Loydell, 2024; Loydell *et al.*, 2025).

All **illustrations**, including palaeontological plates, stratigraphic charts and similar graphics, should be referred to as **Figures**. In the main text, refer to them as Figure # when not in parentheses, or as (Fig. #) when enclosed in parentheses. Figures may be in full colour at no additional cost. They must be inserted in the manuscript as image files with sufficient resolution for both on-screen viewing and high-quality printing. Figures must be placed appropriately within the text and accompanied by a caption located directly beneath each figure. The maximum dimensions for figures are  $175 \times 233$  mm (one journal page). Photographic images must have a minimum resolution of 300 dpi and adequate contrast to ensure proper reproduction.

## Acknowledgements

No more than three lines (in font size 8) are allowed for acknowledgements in single-page abstracts.

#### REFERENCES (Examples)

- Klock, C., Desrochers, A., McLaughlin, P.I., Emsbo, P., De Backer, T., Jonckheere, F. M., Esteves, C.J.P. and Vandenbroucke, T.R.A. 2024. Chitinozoan biostratigraphy through the Aeronian—Telychian boundary interval on Anticosti Island, Canada. *Journal of Micropalaeontology*, 43, 475—495. https://doi.org/10.5194/jm-43-475-2024
- Kříž, J. 1998. Silurian. In: Chlupáč, I., Havlíček, V., Kříž, J., Kukal, Z. and Štorch, P. (eds), *Palaeozoic of the Barrandian (Cambrian to Devonian)*. Český geologický ústav, Prague, 79–101.

<sup>&</sup>lt;sup>1</sup> Department, Center, City, Country. Email. (font size 10)

<sup>&</sup>lt;sup>2</sup> Department, Center, City, Country. Email.

<sup>\*</sup>Corresponding author: correspondingauthor@email.com (font size 10)

- Radzevičius, S., Raczyński, P., Garbaras, A., Cichon-Pupienis, A. and Želvys, T. 2024. Integrated stratigraphy of the Llandovery-Wenlock Boundary in the Łopianka–2 outcrop of the Sudeten Mountains, southwest Poland. *Lethaia*, 57(2), 1–9. https://doi.org/10.18261/let.57.2.8
- Yu, S., Li, Q.J., Kershaw, S., Munnecke, A., Mao, Y.Y. and Li, Y. 2024. Rhuddanian to Aeronian (Llandovery, early Silurian) carbon isotope stratigraphy throughout carbonate sequences in the upper Yangtze region, South China block. *Island Arc*, 33(1), article e12512 (11 pp.). https://doi.org/10.1111/iar.12512

The **maximum file size** for the abstract or short paper, when submitted as a **Word document** by e-mail, must not exceed 15 MB. If the file size is larger, please send it to the organisers using Dropbox or WeTransfer.

Please send your abstract to: sarome01@ucm.es before 1st July 2025.

The abstracts will be published in a special volume of *Palaeontological Publications*, edited by the Spanish Palaeontological Society.

If you are unsure about the formatting specifications, please consult a previous volume of the same journal where abstracts and field trip guides from a similar meeting were published:

https://sepaleontologia.es/wp-content/uploads/2024/07/Zamora-et-al.-2022-Symposium-Fossil-Decapods-l.pdf