

# Newsletter

# S2S-Future

October 2021

Marie Skłodowska-Curie Actions  
The Innovative Training Networks



## **Editorial**

*Welcome to the second issue of the S2S-Future Newsletter. The project has been making significant progress over the past six months: all ESRs have been recruited, the Mid-term check has been successfully concluded, Dragonstone 2 field trip took place in Northern Spain, several ESRs have started/finished their secondments.*

*We are now looking forward to several upcoming milestones. At the end of October, the Supervisory Board will virtually meet and the members of the External Advisory Board (prominent S2S experts) will join for the first time and give their feedback. The following Supervisory Board is planned for April 2022 and will be hopefully held onsite in Vienna during the EGU annual meeting. Another important news is that the session proposed by a group of our ESRs has been included in the programme of EGU. Finally, the next summer institute "Factory" will take place in Norway and Switzerland in Spring 2022 (from the end of May to mid-June), but more details on this will be provided in the next issue.*

*In this issue, you will read about the past network meetings, Dragonstone 2 fieldtrip, ESRs' secondments, and two recently hired ESRs Pia-Rebecca Ebner and Ekta Aggarwal. Moreover, Iwan Setiawan (ESR 1) and Panagiotis Giannenas (ESR 11) have written short reviews on two seminal articles in their field of expertise. You will be also reminded about the upcoming events.*

*We hope you will enjoy the reading and don't miss our regular updates through website and social media channels.*

*Milica Pejovic- Project Manager*

## **Summary of the Issue**

- **Past network meetings**
- **Dragonstone 2 fieldtrip**
- **Secondments testimonials**
- **Meet ESR 8 and ESR 13!**
- **Review articles by ESRs**
- **Write down in your agenda!**

## Supervisory Board and Steering Committee meeting

Online, March 2021

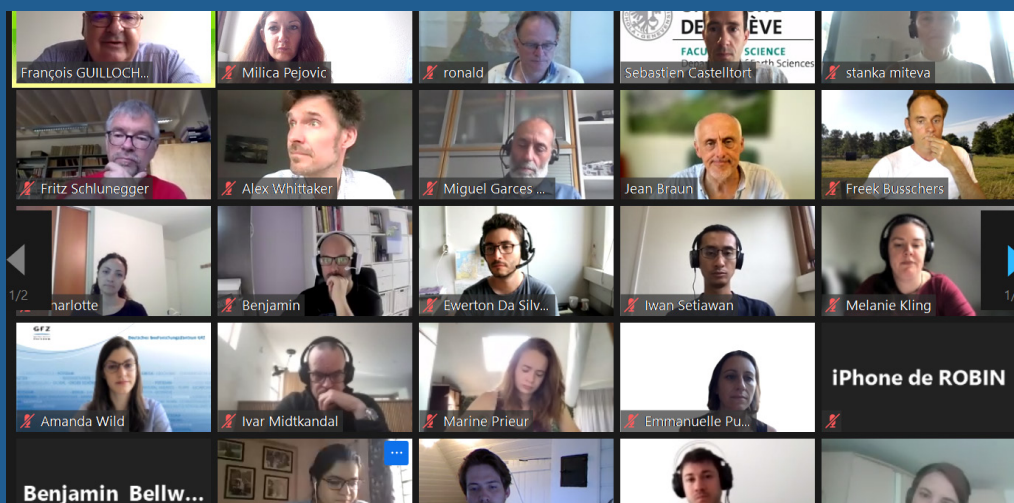
The Supervisory Board and Steering Committee Meeting was held remotely on 24 March 2021. The representatives of the beneficiaries and partner organisations discussed the project progress and adjustments in the light of the pandemic. The leaders of the four scientific work packages WP1 “Slow”, WP2 “Rapid”, WP3 “Impact”, and WP4 “Models” displayed the main achievements within each work package and the first animation activities such as reading groups and abstract writing sessions. The participants also discussed the training activities and decided to postpone “Dragonstone 2” training programme for the end of the summer since the sanitary situation prevented any earlier organization of this summer institute. The training programme “Factory” has been also postponed for spring 2022.

## Mid-term check meeting

Online, June 2021

The Mid-term check meeting was held on 17 June 2021. The S2S-Future network, including all principal researchers, ESRs and representatives of partner organisations, virtually met the Project Officer from the European Commission, Ms Stanka Miteva. The aim of the meeting was to assess the fulfilment of the recruitment procedure, the eligibility of the fellows, any deviations of the original training programme and to raise awareness on the fellows’ and host institutions’ rights and obligations.

Firstly, all scientists-in-charge and the representatives of partner organisations briefly presented their research team and described their role within the network. Then, Ms Miteva gave a presentation on general MSCA-ITN rules and suggestions on the correct grant management. Subsequently, the coordinator presented the progress report, including the scientific, training, networking and management aspects of the project. The ESRs then presented their background, research project, planned training, and career aspirations. In the afternoon, the Project Officer met the ESRs and the coordinator during the restricted sessions. At the end of the meeting, there was an open table discussion during which Ms Miteva gave their feedback and congratulated the Consortium and the ESRs on the excellent management of the action.

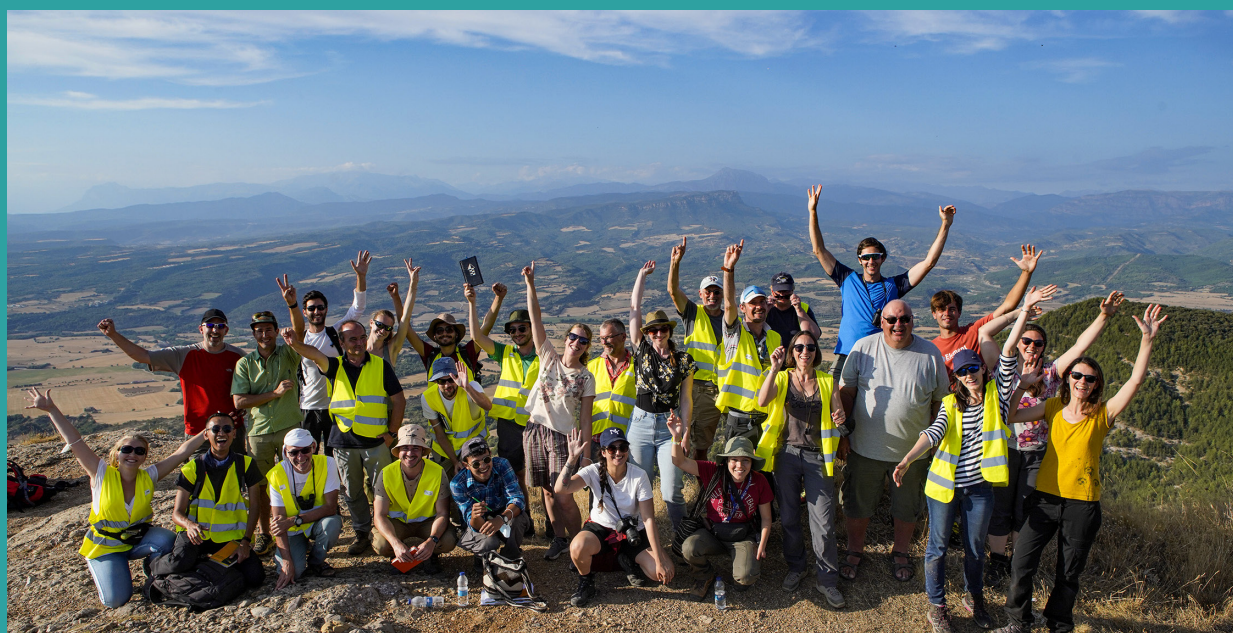


## Dragonstone 2

Spain, August/September 2021

Dragonstone 2 was held in Northern Spain from 25 August to 10 September 2021. The main organisers of the workshop were the University of Geneva and the University of Rennes 1. While Dragonstone 1 had set the theoretical foundations, the focus of Dragonstone 2 was on field examples and excursions in the southern-Pyrenees in Spain: from alluvial fans of the northern Trespas basin all the way down to deep basinal turbidites of the Zumaya area, following marker timelines such as the PETM, the EECO and the MECO. These field excursions were combined with presentations by the principal investigators and the representatives of partner organisations, and the final four-day course focus on seismic geomorphology and sequence stratigraphy with a specific focus on particulate gravity flows in source-to-sink sedimentary systems.

[More info](#)



## ESRs' secondment testimonials

### Aurora Machado Garcia (ESR 7)

«I have done my secondment at VBPR from February until July 2021, under the close supervision of Benjamin Bellwald, where I have interpreted key horizons to understand the sedimentation at the North Sea Fan during the Last Glaciation, which comprehends the core of my dataset. I have fully mapped the seven horizons using 3D high resolution seismic reflection data - Base of Last Glaciation, AMS51, AMS54, AMS55, AMS57 and Seabed, interpreting every 150m, adding up to 1125 inlines + crosslines per horizon. Additionally, I have also mapped two contourite bodies and one major channel incision where interpretation was conducted in even greater detail – every 75m. Later, the horizons were gridded in order to extract attributes and conduct seismic geomorphological interpretation. The preliminary results were displayed in a two-minute presentation during vEGU21, receiving important and constructive feedback and will also be presented during the Mid-European Geomorphology Meeting in November as a poster. The feedback and interpreted data are now being further developed and are leading up to a publishable manuscript.»



*Aurora and VBPR team*

### Ariel Henrique do Prado (ESR 12)

«I started my secondment with the Stiftung Landschaft und Kies (SL&K) on 27.04.2021 with my first visit into a gravel mine in Rubigen guided by Roger Lötchser and Irina Brengener. There I could learn how the company manages its environmental preservation spot which they also use as an education environment for the open public. I was also able to visit the internal part of the company where the pebbles are cleaned and sieved for later sale. On 29.06.2021 I participated in a visit to the gravel mine in Rubigen for the public. This visit was more focused on showing how gravel mines are now a refuge for some animal and vegetal species that previously lived on the rivers floodplains. An example of these species is the yellow-bellied toad, which needs very clean water and a protected environment, which the company's biologists supply in the gravel mines. On 18.09.2021 I visited the Berken gravel mine in another visit open to the public for more than 50 persons. In this visit I could observe how the company does an important connection with the Swiss society showing not only their facilities but also the importance of environmental preservation.»



*Gravel mine in Rubigen*

### **Ewerton da Silva Guimarães (ESR 6)**

«My time at TNO is very important for my professional development and also crucial for the progress of my research. This secondment is giving me the opportunity to get in touch with very experienced professionals that have a vast knowledge of my study site and subject, allowing me to come up with new ideas for my research. With TNO I am developing fundamental skills to conduct data analysis in GIS-environment, and also to analyze and correlate borehole data. Furthermore, I am learning new concepts specific for my research as well as the geology of the Netherlands. I am very grateful to be allowed to work closely with TNO's team and also to have access to their rich database, which is carefully being built and managed for many decades, and will undoubtedly enhance my research. I am looking forward to next steps of my collaboration with TNO.»



*Ewerton at TNO's core storage*

## Rocío Jaimes-Gutiérrez (ESR 10)

«My name is Rocío Jaimes and I work in the Earth Surface Dynamics group at the University of Geneva in Switzerland. Currently, I am visiting the University of Burgundy, France, in a secondment for my Ph.D. project. I came for the first time to Dijon in March, when I stayed for one month and a half. This time, I plan to stay for four months to work on the Hafnium and Neodymium radiogenic systems of samples from Palaeocene-Eocene Thermal Maximum (PETM) sections in the Spanish Pyrenees. Due to their different behavior when exposed to Earth surface processes, these systems are used together as a chemical weathering proxy. While in Switzerland, I analyzed the clay mineralogy and Oxygen and Hydrogen stable isotopes in Thierry Adatte's group at the University of Lausanne. By the end of my secondment, I expect to have a profile of the evolution of the chemical weathering intensity during the PETM, thus contributing to understanding how the Earth's surface responded to global warming. I find Burgundy to be a beautiful region, and I have found a friendly and dynamic Biogeosciences working group in Dijon. I am keen to see the first results from the chemical weathering intensity and incorporate this information into numerical models with Prof. Jean Braun in Potsdam.»



*Rocio in the lab in Dijon*

# ***MEET OUR ESRS!***





I am a Research Scientist with a background in climate geochemistry. Working at Max Planck Institute in Mainz (Germany) for four years, where I graduated my masters degree, I gained a strong ability in several sedimentological and chemical laboratory procedures. I have a pronounced interest in studying a broad range of scientific topics, amongst them the adaptability of living organisms to climatic conditions. My greatest pleasure is spending time outdoors enjoying the sensation of the infinite width.

Pia-Rebecca Ebner (ESR 8)

*Imperial College London*



Thesis: Releasing the sediment cascade: understanding grain size as a record of mass transfer in source to sink systems

Supervisor: A. Whittaker



Having an inclination towards the study of the Earth, I completed my undergraduate and Master's studies in Geology at the University of Delhi, India. During my masters' dissertation I explored process-based sedimentology research in parts of the Paleoproterozoic formations in Central India. Subsequently, I pursued an M.Phil. in Natural Resource Management from the Indian Institute of Forest Management. My thesis was on monitoring the hydrological extreme events (droughts) over the Central Indian Landscape and assess its usage for large-scale climate change vulnerability and adaptation studies. During the course, various opportunities facilitated me to explore the research-intensive environment at premier institutes in India, USA and Japan. Overtime my interest developed in understanding the connection between human activities and their immediate surroundings using geospatial techniques.

Ekta Aggarwal (ESR 13)

*Imperial College London*

Thesis: How do Source-to-sink landscapes and systems impact patterns of human habitation?

Supervisor: S. Gupta

**A review of «Canons of Landscape Evolution» by Lester C. King (1953)  
Bulletin of The Geological Society of America, Vol. 64, pp. 721-752, July 1953**

*Author: Iwan Setiawan (ESR 1)*

Lester C. King is regarded as one of the most influential geomorphologists of the twentieth century (Twidale, 1992). He had a vast amount of contribution to the global knowledge in understanding landscape evolution especially plains (here referred as pediments). This specific paper that was published in 1953 provides alternative models and widely accepted ideas of pediplanation (scarp retreat and pedimentation) in shaping the land surface. King challenged Davis' concept of slope flattening (peneplanation/downwearing) as a general process of landscape evolution. Particularly he disagreed with Davis' concept of the "Cycle of Erosion" which explained that an uplifted land subjected to subaerial erosion was first vigorously incised by the deeply cut valleys of the rejuvenated river systems, and later reduced by weathering and lowering of the interfluves to a lowland relief which Davis called by peneplain. He cited that Davis' concept is only locally subjected to his work in Pennsylvania to New England without any comparison to other landscapes in other parts of the world.

King stated that landscape is a function of process, stage, and structure. Their relative importance is indicated by their order. According to him, the primary process in shaping landscapes over the greater part of the earth's surface is pediplanation which is a combination of parallel scarp retreat and pedimentation. King agreed with the four elements of hillslope proposed by Wood (1942), the waxing slope, free face, detrital slope, and waning slope (usually pediment). He mentioned that the most active elements of hillslope evolution are the free face and debris slope. If they are actively eroded, the hillside scarp will retreat parallel to itself. Erosion of the free face and debris slope is accomplished primarily by rill wash forming gully heads. This parallel retreat of the scarp is commonly known by backwearing. He agreed with the idea advised by Kirk Bryan (1922, 1935, 1936) and Fair (1947) that running water, in the form of sheet wash or rills, is crucial in developing pediment after the retreat of the steeper hillside under weathering.

According to King, pediment is a planate landform originated by retreat of the hillslopes, showing concave profiles and cut-rock features. It is found in all three climatic regimens (semiarid, arid, and humid). Pediments are normally veneered with thin layer of detrital material which is in process of transport across them. The ultimate landscape composed of many coalescing pediments is termed a pediplain. King highlighted that major continental erosion scarps in many lands retreat at a rate of about a foot in 150 years to a foot in 300 years. This shows that over long periods, the rate of scarp retreat is sensibly constant. Pediments which have ceased to evolve may show weathering of the bedrock. King also stated that a landscape that has been reduced to a pediplain may remain stable with only minor alternation for an indefinite time.

King has mentioned the importance of backwearing (scarp retreat) over the downwearing (peneplanation) proposed by Davis. However, both processes may work together and equally influential to the development of pediments. Lateral planation by river processes (highly anastomosing rivers) also takes important role in forming pediment as much as hillslope processes (scarp retreat). Concave profiles may not be the only possible descriptive explanation for pediments, for example, pediments could also be tilted afterwards due to tectonic uplift or mantle plume. King also mentioned that land surface may be dated by the overlying deposits. The technological advances several years later make it possible to have better age resolution from dating techniques, either using isotope-based (cosmogenic nuclide Beryllium-10, radiocarbon, etc.) or thermochronological methods (apatite fission-track, apatite U-Th/He, etc.). On the other hand, in areas with active volcanic activities, e.g. Ethiopia, Libya, Egypt, Chad, Sudan, etc., dating data from the volcanoes, dykes, and basalts could also be extremely useful in constraining the ages of the surfaces and the scarps. Finally with the rapid advance in technology nowadays, numerical modelling has been a major tool in understanding landscape evolution by simulating the past conditions and even predict the future conditions.

At the end of the day, this classic paper by Lester C. King remains relevant to this day even though it was first published in 1953, almost 70 years ago. It has become a legacy for next generation of geomorphologists come after him to improve and understand better the landscape evolution, especially on pediments/pediaplains.

### **A review of “Carbonate ramp depositional systems” by Burchette, T. P., and V. P. Wright (1992)**

*Author: Panagiotis A. Giannenas (ESR 11)*

This brief article is a throwback to the 1990s, referring to a fundamental paper by Burchette, T. P., and V. P. Wright: “Carbonate ramp depositional systems” published in August of 1992 in the journal of Sedimentary Geology (v. 79, p.3-57) based on the concept of carbonate ramps (as an alternative to the shelf model) which was initially identified and discussed by Ahr, W. M in 1973.

In this paper, Burchette, T. P., and V. P. Wright after proposing the use of the classic ramp classification/subdivision (also previously used by Wright, 1986, Burchette et al., 1990), inner-ramp (above FWWB), mid-ramp (between FWWB and SWB), outer-ramp (below SWB) and outer-slope environment (on distally steepened ramps), they then discuss in detail this type of depositional profile exploring and covering its various aspects. Their discussion is based on a table which shows a collection of published data on carbonate platforms and their characteristics from Late Proterozoic to Holocene. Among the topics tackled are carbonate ramp facies, profiles, diagenesis, tectonic settings (e.g. passive continental margins, extensional basins, compressional basins etc.), sequence stratigraphy and controls on ramp development as well as ramp geometry and seismic character.

They mention that in general, carbonate ramps were dominant at times when reef-constructing organisms were absent or inhibited and are most common in sedimentary basins where subsidence is flexural and slow and gradients are slight over large areas. These are mostly cratonic-interior basins, passive continental margins, and foreland basins. An important observation that is inferred from a compilation of data of biodiversity relating to organisms important to carbonate ramp facies and their evolution/distribution through time shows that there was a significant shift in the zone of greatest organic carbonate production from the mid-ramp to the inner-ramp since the Late Jurassic which coincides with the rise of calcareous pelagic foraminifera, implying but not directly proving their relationship. Also, they discuss the comparison of how ramps and rimmed shelves respond to sea-level variations. They conclude that during sea level falls, ramps can down step (forced-regression) and create a LST wedge whereas in the same scenario, rimmed shelves which appear flat-topped are subjected to subaerial exposure and production is potentially disrupted. Also, in general, the carbonate productivity profile of carbonate ramps records a difference compared to that of rimmed shelves and this is evident across the shoreline to basin transition where the contrast in productivity is less marked for ramps.

Finally, a last but significant aspect discussed in this paper is related to petroleum geology and the economic importance of carbonate ramps in terms of petroleum source potential, reservoir systems and types. For instance, isolated buildups usually found in the mid to outer ramp represent one of the most common petroleum reservoirs in ramp systems. Grainstone reservoirs are also widespread and range from shoreline carbonate bodies to major detached shoal complexes or shoals over offshore highs.

To summarize, this is a landmark paper and a significant contribution in Carbonate Sedimentology and Stratigraphy and by extension in source to sink systems with its proposed ramp classification and concepts still being widely used by many authors in the geoscience community all around the world. perhaps timeless concepts. It reminds us that even though the new generation of geoscientists has started working and thinking in a more complex and holistic way utilizing the source to sink approach using all state-of-the-art research methods, tools and techniques, this approach, is evolving upon a foundation which consists of some classic, fundamental, well established and perhaps timeless concepts.

#### *References*

*Ahr, W. M., 1973. The carbonate ramp: an alternative to the shelf model: Gulf Coast Association of Geological Societies Transactions, v. 23, p. 221-225.*

*Burchette, T.P., Wright, V.P. and Faulkner, T.J., 1990. Oolitic sandbody depositional models and geometries. Mississippian of southwest Britain: implications for petroleum exploration in carbonate ramp settings. Sediment. Geol., 68: 87-115.*

# WRITE DOWN IN YOUR AGENDA!

## Supervisory Board Meeting: 29 October 2021, Online

The next Supervisory Board Meeting is scheduled for 29 October 2021 online. The members of the External Advisory Group will attend for the first time the meeting and give their feedback on the research and training activities within the project. The EAG will consist of recognized S2S-experts, namely Anne Bernhard (Freie Universität Berlin), Hielke Jelsma (Anglo American), Vivi Kathrine Pedersen (Aarhus University) and Alexander Densmore (Durham University). The most substantial part of the meeting will be dedicated to the discussions on ESR progress and the updated Personal Training and Career Development Plans.

## EGU: 3-8 April 2022, Vienna

The EGU General Assembly 2022 brings together geoscientists from all over the world to one meeting covering all disciplines of the Earth, planetary, and space sciences. The next ITN S2S-Future Supervisory Board Meeting will coincide with the EGU, which is planned to have a hybrid format this year, enabling both onsite and online participation. Stay tuned also for the session proposed by our ESRs!

## “Factory” training programme: end of May/beginning of June 2022, Norway and Switzerland

The next ITN training programme “Factory” will start on 29 May 2022 and will last around two weeks. The programme and the exact days are in the phase of definition and will be communicated soon.



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