

An early stage researcher (ESR) PhD position is available at the Vrije Universiteit Amsterdam as part of the Marie Curie Innovative Training Network “S2S-FUTURE”

ORGANISATION/COMPANY	Vrije Universiteit Amsterdam (VUA)	TYPE OF CONTRACT	<i>Temporary</i>
RESEARCH FIELD	Earth Science	JOB STATUS	<i>Full-time</i>
RESEARCHER PROFILE	<i>First Stage Researcher (R1)</i>	HOURS PER WEEK	40
APPLICATION DEADLINE	<i>1/03/2020 23:59 - Europe/Brussels or until position is filled.</i>	OFFER STARTING DATE	<i>As of 01/08/2020</i>
LOCATION	the Netherlands › AMSTERDAM	EU RESEARCH FRAMEWORK PROGRAMME	<i>H2020 / Marie Skłodowska-Curie Actions</i>

Host institution

Vrije Universiteit Amsterdam (VUA) is a leading, innovative and growing university that is at the heart of society and actively contributes to new developments in teaching and research. Our teaching and research embrace the whole spectrum of science – from the humanities, the social sciences and the pure sciences through to the life sciences and the medical sciences. Our university has ten faculties which span the wide range of disciplines, as well as several institutes, foundations, research centres, and support services. Vrije Universiteit Amsterdam is home to more than 24,500 students. We employ more than 4,600 individuals. The VU campus is easily accessible, located in the heart of Amsterdam’s Zuidas district, a truly inspiring environment for teaching and research.

Research at the Department of Earth Sciences ranges from Planetary Sciences, Geology, Physical Geography to Hydrology. The Department has strong links with industry (e.g. geothermal energy, hydrocarbons, groundwater). In addition, the Department’s research addresses societal issues, like climate change and hazards. The Department consists of two research clusters: “Earth and Climate” and “Geology and Geochemistry”. The Department can thus study all aspects of System Earth, with an integrated dynamical approach. Within the cluster “Earth and Climate” a main research theme is focused on the evolution and variability of the Earth’s Climate in terms of processes, controlling factors and feedbacks in oceanic, terrestrial and atmospheric transport of heat, water, gasses, and sediments. The group of Ronald Van Balen addresses mainly fluvial and aeolian systems, at Quaternary to Holocene time-scales, using fieldwork, proxy analyses and modeling.

Research objectives

Following the Mid-Pleistocene Climate Revolution (around 900.000 years ago), intensification of glacial-interglacial climate variability had major impacts on sediment fluxes and grain sizes transported by Northwest European fluvial systems. In general, increased sediment fluxes and severe grain size coarsening are reported. However, insights on the effects of these climatic changes at catchment scale are still limited. This project will assess sediment grain size, provenance, erosional/deposition changes, and sediment volumetric changes in the Meuse River catchment since the Middle Pleistocene. Apart from climate change, the study area is affected by tectonic uplift of the catchment (source) and subsidence in the adjoining rift system (sink). This research will improve general insights in fluvial system behavior and associated source to sink responses as a response to climate change and tectonics.

In this project we will first map and characterize sediment grain size distributions, provenance change and terrace incision versus aggradation from the upstream regions in France and Belgium to the downstream regions in the Netherlands. Second, the mapped data will be set in a temporal framework using available age control, and new cosmogenic, luminescence and paleomagnetic datings, allowing for assessing temporal and spatial variations in these parameters during the last Middle Pleistocene glacial-interglacial cycles. Third, volumetric sediment changes in the Meuse catchment will be analyzed for each cycle, allowing to establish upstream-to downstream sediment budget variation through time. This allows a quantitative assessment of the source-to-sink routing system in relation to change in climate cyclicity and tectonic motions.

Presentation of the research project (cooperative aspect)

This PhD position is within the framework of a European ITN project named S2S-FUTURE: SIGNAL PROPAGATION IN SOURCE TO SINK for the FUTURE of earth Resources and Energies involving 15 PhD positions.

Supervised by Ronald van Balen (Professor, Vrije Universiteit Amsterdam, VUA, Quaternary Geology and Geomorphology), Freek Busschers (TNO Geological Survey of the Netherlands), Renaud Bouroullec (TNO Geological Survey of the Netherlands) and Kees Kasse (VUA,) the PhD student will collect morphological, sedimentological, provenance and grain size data of fluvial sediments deposited around the Mid Pleistocene climate transition for the Meuse river terrace deposits and correlatable sediments in the downstream basin. The project involves field work and mapping in the Netherlands, Germany, France and Belgium, data mining (CPT's, corings, geo-electrics), dating (cosmogenic, paleomagnetic, luminescence), modelling, and research stays (secondment) at **University of Bern, Switzerland** (cosmogenic dating Prof. F. Schlunegger; 5 months), and **TNO Geological survey of the Netherlands** (discussions and data mining, Dr. F.S. Busschers and Dr R. Bouroullec).

The PhD student will be also involved in scientific/soft-skills meetings and in research activities conducted in other laboratories/companies from Europe and associated countries.

An important component of the training will be the participation to 3 main major "Summer Institutes":

Summer 2020: "Dragonstone" – South-Pyrenees Spain and France: an innovative combination of field excursion and computer modeling of surface processes from source to sink.

Summer 2021: "The Factory" – Norway, Great Britain and Switzerland: field visit of modern S2S systems and course intensive program of technical and soft skills to accelerate the students' research, write and present their results, consolidate their profiles and develop concrete plans for their future.

Summer 2022: "Inside Africa" – South-Africa: an immersion of ESRs in the modern source-to-sink system of a continental-scale large river, the Orange in Southern Africa, with high economic implications for mining industries.

*In addition to these major milestones of the program, the PhD students will 1) continuously develop their **core research skills via their own research project** locally and within the network while at secondments and conferences, 2) receive a mandatory amount of **hard and soft-skills training** specific to their own doctoral school, along with mentoring by joint supervising bodies, 3) use **EGU conferences both as dissemination events for ESRs results and network events for progress reports and evaluations**, and 4) **collaborate into practical activities aimed at network-structuring legacy deliverables.***

*The goal of S2S-FUTURE is to **understand, quantify and model the sediment routing system from the sediment production (source) to the sediment deposition (sink); its tectonic and climatic controls; and to establish generic rules for a full understanding of signals propagation in S2S systems** for building predictive models of sediment location and characteristics. These studies of S2S systems require **interdisciplinary approaches** combining geomorphology, sedimentology and stratigraphy, geochemistry, tectonic and paleoclimatology coupling observations, quantifications and process modelling. All these skills are integrated in the S2S-FUTURE project.*

*The objectives of S2S-FUTURE have been designed with primary societal implications in the domains of **water, carbon-derived energy, sustainable geological energy and geological storage of non-geological energy, waste geological storage, mineral resources, and building materials**. These points have become crucial for sustainable investment and development according to several of the United Nations Sustainable Development Goals such as **SDG#6 (Clean water and sanitation), SDG#7 (Affordable and clean energy) and SDG#13 (Climate action)** among others.*

Benefits

With *indicative* financial conditions of the research project (in local currency)

- The appointment will initially be for 1 year. After a satisfactory evaluation of the initial appointment, the contract will be extended for another 2 years.
The salary will be in accordance with university regulations for academic personnel and amounts €2709 (PhD) gross per month during the first year and increases to €2972 (PhD) gross per month during the third year, based on a full-time employment.
- A maximum of 41 days of annual leave based on full-time employment
- 8% holiday allowance and 8.3% end-of-year bonus
- Contribution to commuting expenses
- optional model for designing a personalized benefits package
- Be part of a large and enthusiastic international team, where own initiatives and ideas are encouraged, with the opportunity to sculpting the future of Source-to-Sink research and network in Europe
- Possibility to collaborate with a large network of international research groups engaged in the ITN

Requirements

- The candidate should be in the first four years of their research career. They should not have a doctoral degree and fulfil the eligibility criteria and mobility rule (see below)

S2S-FUTURE

- *The candidate should hold or be about to obtain a Master's degree in Earth Science or relevant field.*
- Excellent technical skills including field experience in morphology, sedimentology, GIS, matlab/Python/R analysis
- Previous experience working with morphological data, coring, fieldwork.
- The ability to work both as part of a team, and independently, coupled with excellent communication, organizational and problem-solving skills
- Availability to travel for training events and research secondments.

ELIGIBILITY CRITERIA

Recruiting is in accordance with the European rules for Marie Curie Initial Training Networks. Early-stage researchers (ESR) can be of any nationality. They must be, at the time of recruitment by the host organization, in the first four years (full-time equivalent) of their research careers and have not yet been awarded a doctoral degree. The research career starts after the degree that enables a student to proceed with a PhD (usually, the Master degree).

MOBILITY RULE

At the time of the recruitment by the first host institution, the ESRs must not have resided or carried out their main activity (work, studies, etc.) in the country of their first host institution for more than 12 months in the 3 years immediately before the recruitment date. Short stays such as holidays and/or compulsory national service are not taken into account.

How to apply

Send your complete application before 1st of March to both contacts below, preferable through the VUA's website, <https://workingat.vu.nl/vacancies>

A **single pdf file** needs to be submitted including:

- a cover letter, stating your research motivation and interests; including relevant background and career plan (max 1 A4 page)
- a Curriculum Vitae, including academic background, previous research and/or industrial experience (max 2 A4 pages)
- Degree transcripts (with marks)
- English language qualification certificates (or equivalent)

Reference letters:

- at least 2 confidential reference letters from academics (including name, position and email address of the referee) (max 1 A4 page, with substantiated assessment of the applicant's technical skills, creativity, innovation ability, working capacity, efficiency and level of independence) must be sent directly to the contacts below.

Contacts:

ESR Supervisor: r.t.van.balen@vu.nl

Project website: <https://cordis.europa.eu/project/rcn/224709/factsheet/en>