Summer School „Dates and Rates of Change in the Quaternary"

From 21st to 27th August 2016, the Graduate School of Geosciences (GSGS), University of Cologne (UoC) held a summer school on Dates and Rates of Change in the Quaternary. The event was convened by Prof Tibor Dunai and Dr Georgina King (both Department of Geosciences, UoC) and organised by Dr Karin Boessenkool, with support by Eileen Czempinski (both GSGS). The venue was the Burg Blankenheim Youth Hostel, where we all were made to feel most welcome.

Funding

The summer school was funded from the Excellence Initiative of the German federal and state governments through the Institutional Strategy (ZUK, measure 3) of the University of Cologne as a part of the planned activities of the GSGS. Additional support came from regional Geo-Alliance *geoverbund ABC/J*.

Aim

The scientific goal of the summer school was to provide an in-depth introduction into the main dating tools and quantitative rate measures of processes that are used in Quaternary Science. The school was focused at an international audience of early-career scientists, was held entirely in English, and also aimed to establish lasting contacts between young researchers in Quaternary Science.

Academic excellence can only be achieved by collaboration and exchange of knowledge on all levels. (…)

Events such as this summer school are an excellent means to expand our network across the globe and the Cologne Department of Geosciences is a great place to convene this summer school.

Prof Dr Gudrun Gersmann

Local expertise and international speakers

With several state-of-the-art analytical facilities and laboratories, such as CologneAMS - the Accelerator Mass Spectrometry facility - and the Cologne Luminescence Laboratory, the University of Cologne was well placed to host this event. In the Institute of Geology and Mineralogy and the Institute of Geography (Department of Geosciences), four working groups specialize in a range of dating techniques that are applied in Quaternary Science. Apart from the conveners, Cologne geoscientists Ascelina Hasberg, Dr Janna Just, Dr Stephanie Kusch, Benedikt Ritter, Jasmijn van 't Hoff, Dr Finn Viehberg, and Dr Volker Wennrich shared their knowledge with the summer school participants in lectures and practical exercises.

Fig. 1. Practical exercises and demonstrations (clockwise from left): composite core stratigraphy, magnetic dating, luminescence dating.

We gratefully acknowledge the dedicated contributions by Dr Rachel Smedley of the University of Aberystwyth, Professor Finlay Stuart of the Scottish Universities Environmental Research Centre (SUERC) and of the University of Glasgow, and Dr Peter Abbott from the University of Swansea. They not only contributed their expertise through some excellent lectures and exercises, but were present and available for further scientific discourse with the participants for the duration of the summer school.

Lab visits

Participants were given the opportunity to tour CologneAMS and the Cologne Luminescence Laboratory on the Saturday following the summer school. Current PhD students David Strebler and Franz Hartung are gratefully acknowledged for leading the tour of the Cologne Luminescence Laboratory and for sharing details of their current research. We are thankful to Richard Altenkirch and Claus Müller-Gatermann of the Physics Department who likewise lead the tour of the CologneAMS.

Announcement and selection procedure

The summer school was announced through the GSGS website and newsletter, through the internet pages of geoverbund ABC/J, through several subject-specific international listservs, such as those of the Quaternary Research Association, Gilbert Club, the INTAV community, the INTIMATE network, the Tephra mailing list, through personal contacts and through social media.

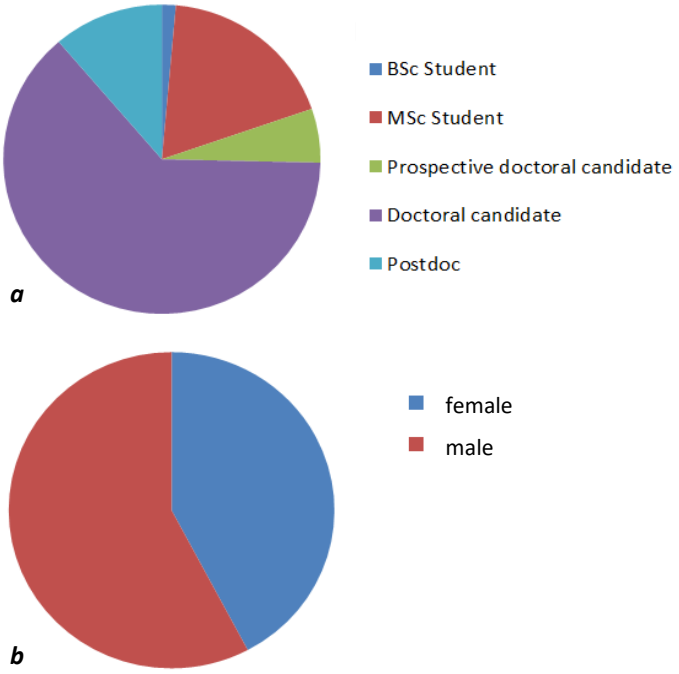

Fig. 2. Diversity of summer school participants; distribution by a) career stage and b) gender

We received a total of 79 applications, in the form of a motivation letter and CV, a large number of which were of high to very high standard. Master students and anyone applying for a Summer School Travel Grant had to submit a supervisor support statement. Each application was rated by at least two of us independently, based on the quality of the motivation letter and the research focus of the candidate. After final ranking, 74 applicants were invited to attend, 24 received an official invitation letter for visa procedures, and 40 applicants from outside Germany were offered a Summer School Travel Grant in the form of a lump sum based on DAAD (German Academic Exchange Service) rates.

Participants

In the end 71 invitees participated, including 6 current and 3 prospective GSGS members. The participants' diversity is summarised in Figure 2.

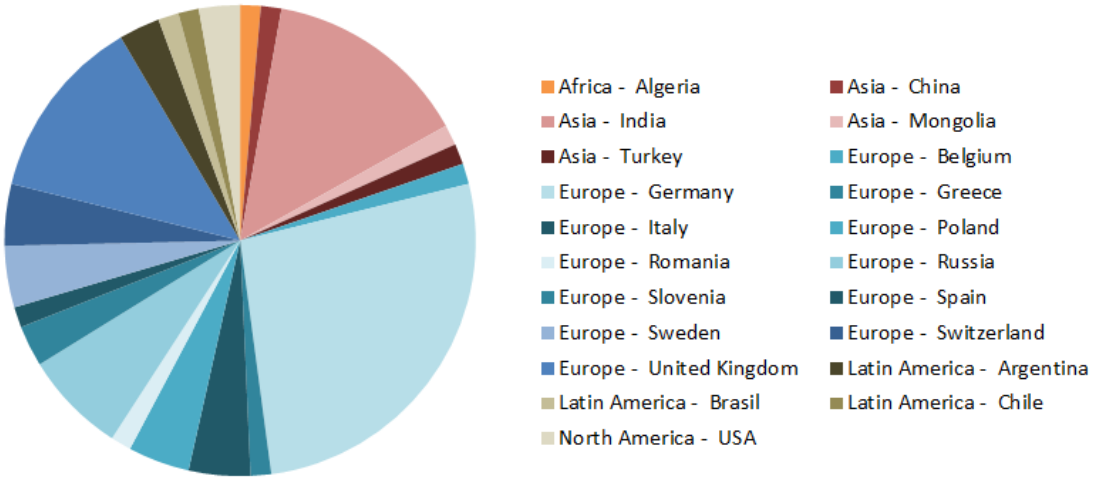

Fig. 3. Countries where the summer school participants currently reside (by continent).

The participants jointly represented 27 nationalities; the 21 countries where they currently reside are summarised in Fig. 3.

Programme

On the first full day of the summer school, lecturers and participants were welcomed by Professor Dr Gudrun Gersmann, Vice-Rector for International Affairs of the UoC, who emphasised the importance of international collaboration and exchange of knowledge for academic excellence.

Fig. 4. Excursion stops at Ulmen and Wingertbergwand

The programme consisted of a number of comprehensive introductions into several dating techniques and rates-of-change measures that are used in Quaternary Science, including stable and radiogenic cosmogenic nuclides, several luminescence techniques, palaeomagnetic dating tools, tephrochronology, Ar/Ar dating, radiocarbon dating (incl. compound-specific measurements) and a range of biostratigraphic / palaeo-limnological tools. The sections on luminescence and palaeolimnology included demonstrations of equipment and practical exercises (see Fig. 1).

One full day was dedicated to an **excursion** in the Eifel region (Fig. 4) which focussed on volcanic deposits, including tephra, lacustrine sedimentary archives and coring techniques. It was led by Benedikt Ritter, Peter Abbott and Volker Wennrich.

Over thirty of the participants presented a poster on their own research topic during one of two lively **poster sessions** (see Fig. 5). Discussions went on until well after nightfall by the light of people's mobile phones.

Fig. 5. Impressions of one of the poster sessions.

The full programme can be found in Annex 1.

Outcome

The Summer School on Dates and Rates of the Quaternary had three key outcomes: 1) participants were trained in the basic principles of a number of different dating techniques, relevant to their research, 2) a strong network between researchers at similar career stages was established as exemplified by the new facebook group "*GSGS Summer School 2016*", 3) Germany and more specifically the University of Cologne were established as research leaders in the Earth Sciences, especially geochronology.

Feedback

Feedback from the participants in the form of a questionnaire at the end of the week was overwhelmingly positive with many respondents grateful for the opportunity to participate. The average grade was 1.7 in the German grading system; see also Annex 2. The opportunity to interact with the lecturers was particularly popular, as was the international diversity of participants and the "peer-to-peer-atmosphere". Some areas highlighted for improvement were the meeting room facilities (lack of air conditioning and Wi-Fi), and for incorporation of additional practical courses to complement the lectures.

Outlook

The summer school was a great success which could be repeated in future to foster greater international student collaborations. Such events serve to advertise the University of Cologne as an international centre of research and could be instrumental in recruiting international doctoral candidates.

Further information: http://www.geosciences.uni-koeln.de/datesrates16.html

Karin Boessenkool, Tibor Dunai, Georgina King

All pictures by K. Boessenkool

Graduate School of Geosciences

Summer School "Dates and Rates of Change in the Quaternary"

Venue: Youth Hostel Burg Blankenheim, Burg 1, 53945 Blankenheim, Germany

Convenors: Tibor Dunai & Georgina King (Cologne Geosciences)

Coordination: Karin Boessenkool (GSGS)

	Sunday 21 August 2016	Monday 22 August 2016	Tuesday 23 August 2016	Wednesday 24 August 2016	Thursday 25 August 2016	Friday 26 August 2016	Saturday 27 August 2016
08:00		*08:00 - 09:00 Breakfast*	*08:00 - 09:00 Breakfast*	*08:00 - 09:00 Breakfast*	*08:00 - 09:00 Breakfast*	*08:00 - 09:00 Breakfast*	*08:00 - 09:00 Breakfast*
09:00		09:00 - 09:30 Welcome	09:00 - 10:30 **Luminescence: what, where & when?** G King, R Smedley	09:00 - 19:00 **Excursion in Eifel region** Peter Abbott Benedikt Ritter Volker Wennrich	09:00 - 10:30 **Radiocarbon dating (I)** Stephanie Kusch	09:00 - 10:30 **Palaeomagnetic dating** Janna Just	Participants leave
10:00		09:30 - 11:00 **Cosmogenic nuclides (I)** Tibor Dunai	*Coffee break*		*Coffee break*	10:30 - 11:30 **Palaeolimnology (I)**, Volker Wennrich	Busses leave from Blankenheim Busbf to Blankenheim (Wald) every hour between 07:06 and 14:06 (arriving at xx:16 and connecting to train to Cologne).
11:00		*Coffee break*	11:00 - 13:00 **Practical application: from sample to age** Georgina King, Rachel Smedley		11:00 - 12:30 **Radiocarbon dating (II)** Stephanie Kusch	*Coffee break*	
12:00		11:30 - 13:00 **Cosmogenic nuclides (II)** Tibor Dunai			Discussion / wrap-up	12:00 - 13:00 **Palaeolimnology** Practical 1*	
13:00	13:00 - 18:00 Participants arrive at Blankenheim (Wald) railway station. ~Hourly shuttle service between Blankenheim (Wald) and Youth Hostel. Check-in at Youth Hostel.	*13:00 - 14:00 Lunch*	*13:00 - 14:00 Lunch*		*13:00 - 14:00 Lunch*	*13:00 - 14:00 Lunch*	Visits to Luminescence Lab and AMS facility at the University of Cologne (to be confirmed, optional)
14:00		14:00 - 15:30 **Cosmogenic nuclides (III)** Tibor Dunai	14:00 - 16:00 **Luminescence dating: Recent advances & future potential** G King, R Smedley		14:00 - 16:00 **Tephrochronology** Peter Abbott	14:00 - 15:00 **Palaeolimnology** Practical 2*	
15:00		*Coffee break*				15:00 - 16:00 **Palaeolimnology** Practical 3*	
16:00		16:00 - 17:30 **Stable cosmogenic nuclides** Fin Stuart	*Coffee break*		*Coffee break*	*Coffee break*	**Practicals in 3 groups*
17:00		Discussion / wrap-up	16:30-17:30 **Luminesc. & your research: dating clinic**		16:30 - 18:00 **Ar/Ar dating** Fin Stuart	16:30 - 17:30 **Palaeolimnology (II)**, Volker Wennrich	*a) Core Composite* *b) Magnetostratigraphy* *c) Biostratigraphy* *Ascelina Hasberg, Janna Just, Jasmijn van 't Hoff, Finn Viehberg, Volker Wennrich*
18:00		*18:00 - 19:00 Dinner*	Discussion / wrap-up *18:00 - 19:00 Dinner*		*18:00 - 19:00 Dinner*	Discussion / wrap-up *18:00 - 19:00 Dinner*	
19:00	*19:00 - 21:00 Dinner and ice breaker*	Leisure / sports	19:00 - 20:30 Poster session 1	*19:00 - 21:00* *Barbeque & social evening / sports; if fine weather outside, otherwise Rittersaal*	19:00 - 20:30 Poster session 2	Leisure / sports	
20:00							
21:00							

supported by:

EXCELLENT

Rooms:
Rittersaal
Vogtei

Latitude: 50° 26' 17.68"
Longitude: 6° 39' 7.38"
http://www.geosciences.uni-koeln.de/datesrates16.html

A B C/J geoverbund aachen bonn cologne jülich

University of Cologne

Annex 1

Dates and Rates of Change in the Quaternary
GSGS Summer school, Blankenheim, 21st-27th August 2016
Conveners: Tibor Dunai & Georgina King

Graduate School of Geosciences

Compiled feedback, 1-page summary

Note: The marking system is related to the German system with 1 being the highest mark and 5 the lowest

1 2 3 4 5
(1 = very satisfied) ☐ ☐ ☐ ☐ ☐ (5 = dissatisfied)

How do you judge this summer school as a whole?

	1	2	3	4	5	N=
Summer school as a whole (expectations fulfilled?)	30	23	6	0	0	59
Summer school setup and teaching methods used	26	26	7	0	0	59
Usefulness of this summer school for your work	26	20	12	1	0	59

How do you judge the usefulness of the individual teaching sections?

	1	2	3	4	5	N=
Average of all 9 teaching sections	27	18	11	3	0	59

Please tell us your views on the organisational framework of this summer school

	1	2	3	4	5	N=
Organisation (preparation, prior information, etc.)	46	10	3	0	0	59
Material provided	44	14	0	1	0	59
Meeting rooms and equipment	28	18	10	1	2	59
Chance to talk to the teaching staff	48	10	0	1	0	59

Average of all graded items: 1.7