Researcher	Institution	Year	Topic	Backround	Purpose of the Grant:
Rutger van Limborgh	ETHZ	2020	The influence of in-situ stress field heterogeneity on borehole breakouts		The Bedretto Underground Laboratory is located 2.5h drive from Zülich (location of ETH Zürich). When field visits are executed they last a minimum or 2 days. This is expensive and therefore only 1 visit is planned for my project. It would be beneficial for the project to visit the laboratory more often in order to collect more specific data. Currently we have a limited license for the software program I use to analyse my data, called WellCAD. To analyse the data to a larger extend we need to upgrade this license. For further analysis of my data than possible now, this upgrade would be very beneficial. The resutts of the thesis will be submitted for the GeoUtrecht 2020 Annual Conference. which will be held in August in Utrecht, the Netherlands. When accepted, we anticipate on a poster presentation. To make ~ possible to travel and stay in Utrecht, support of SASEG would be highly appreciated.
Maximilan Haas	Uni Geneva	2020	Geomechanical-geophysical and mineralogical subsurface modelling for CERN's future collider tunnel in the francogenevois basin	As part of the Future Circular Collider (FCC) study at the European Organization for Nuclear Research (CERN) and its associated doctoral thesis at the Université de Genève (both Geneva, Switzerland), an improved geomechanical, petrophysical and mineralogical subsurface model is created for the Western Alpine Molasse Basin for geothermal energy usage and re-use potential of excavated molasse rock. This approach is substantiated by subsurface data (well logging data, borehole & outcrop samples) collected along the current FCC 100 km tunnel alignment and analysed in laboratories from a mineralogical, geochemical, petrophysical and geomechanical point of view. In order to overcome the high level of heterogeneity of the molasse rock, a multivariate statistical approach of analysed parameters is used to indicate thresholds for each of the discovered potential re-use options related to its physical behaviour (e.g. geomechanical and petrophysical parameters) as well as chemical and mineralogical composition. On top of that, data is implemented in a final model supporting tunnelling construction for CERN's future particle accelerator.	The SASEG student grant will be used for the doctoral student, Maximilian Haas, to financially support his laboratory measurements (mineralogical & geochemical) at Eidgenössische Technische Hochschule (ETH) in Zurich
Sam Camalt	Uni Geneva	2019	Controls on gas occurrence in the Marcellus Formation, northeastern USA	In northeast Pennsylvania gas wells have very good production north and west of a fairly sharp boundary that has been nicknamed the "line of death" (Laughrey, 2011, 2015). There is no agreement as to cause: structural, thermal or character of the original sediments. Goal of the thesis is to find an explanation. In autumn of 2018 I was finally able to get some cores samples (Penn. State University, PA State Geological Survey) and subsurface cuttings and core samples from one industry operator - a second operator has promised cuttings but they have yet to appear	Support charges for analytical work on these new samples. Available are 16 core . pieces from the research cores drilled by Penn State and the PA Survey, and 15 from the one company that has provided samples to date. Often there is very little material with which to work, which may require using ICP-MS rather than XRD for detailed characterization. ICP-MS costs Fr. 485 for a day on the machine (16 samples) whereas XRD costs ea. Fr. 150 (again for 16 samples). In addition, QEMscan automated petrology is indicated at Fr. 85/sample. And, of course, we should do RockEval pyrolosis (Fr. 15/sample). Field collection of these samples has cost more than Fr. 4,000.
Joshua Richards	Uni Bern	2019	Effectiveness of pH-modification in mitigating silica scaling in geothermal power plants	Amorphous silica scaling is one of the main factors limiting energy production from high temperature geothermal systems and is likely to be a problem in deep petrothermal projects in Switzerland. A possible mitigation strategy is the acidification of the separated water to slow down precipitation. This was recently introduced at the Hellisheidi power plant SE-Iceland. The precipitation pathways and rates before acidification were characterised in detail in a previous study (van den Heuvel et al., 2018). Building on this, the new MSc project will again collect samples (fluid and silica scales precipitated onto scaling plates) from inside the pipelines as a function of time to assess if and how the precipitation mechanisms and rates are affected by lowering pH. This will allow us to quantitatively assess the effectiveness of acidification as a mitigation strategy for silica scaling. If the study is successful, we plan to publish the results in a journal article.	The money granted via the SASEG Student Grant will be used to fund a trip by J. Richards to the Hellisheidi geothermal power plant (SW-Iceland). This trip has several aims: (1) Observe and understand the production of geothermal energy as well as the layout of the power plant. (2) Witness the sampling procedure first-hand and understand the challenges and limitations of the data collected. (3) Visit naturally occurring hot springs where silica is currently precipitating. Overall, the trip to Iceland will strongly increase the depth of understanding of both the "experimental" set up as well as the factors (temperature, pH, flow rate, ...) controlling silica precipitation inside the pipelines at Hellisheidi. It will also allow us to better understand the results presented in the previous study and to put the data collected as part of the MSc project into perspective.

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Davide Carraro	Uni Geneva	2019	Architectural analysis of a large fluvial-fan succession in humid settings: styles of aggradation, channel-belt avulsion, and overbank organization	Recent developments in fluvial geomorphology and sedimentology suggest that fluvial fans might be responsible for the accumulation of great volumes of clastic successions in continental basins. The possibility of identifying a “typical” stratigraphic signature for aggrading fluvial fans opens a new perspective to interpret continental records, where distinguishing the effects of autogenic dynamics from those of allogenic forcing remains a major challenge. Furthermore, due to the intrinsic heterogeneity displayed by this type of depositional system, the success of exploration for subsurface resources relies greatly on the reliability of the chosen stratigraphical model. From geological and economic perspectives, hydrocarbon exploration and development along continental basin margins have been classically considered as high-risk, low-pay endeavours, given the scarcity of viable conceptual models to address their supposed architectural unpredictability. This research consists of an outcrop-based analysis (9 Mile Canyon and Desolation Canyon, central Utah, USA) of architectural patterns and of spatio-temporal trends in avulsion mechanisms through Palaeocene-Eocene Colton-Wasatch fluvial-fan system of the Uinta Basin (central Utah). Main objectives are: 1) to characterize stratigraphic patterns from mesoscale to system scale (assisted also by photographic coverage by means of a UAV); 2) to interpret their origin in order to unravel mechanisms of system-scale aggradation/progradation, which ultimately led to the distributive organization of drainage and sediment diffusion through the system; 3) to carry out compositional and provenance analysis (geochemical and isotopic stratigraphy) to identify geochemical signatures of allogenic controls.	Funding is necessary for the second mission due to take place during Spring 2020. (The first one, targeting the distal part of the fluvial fan, i.e Wasatch Formation, was fully sponsored by a Swiss FNS grant). The Green River currently cuts through the target succession, which is exposed with particularly high quality in the Desolation Canyon (central Utah, USA). Due to the remoteness of the location, the field area is to be reached descending the river by boat. By mean of a thorough stratigraphic mapping, the primary goal would be to reconstruct a north-south architectural transect to be correlated with datasets from the previous campaign. Next to direct ground surveying, we plan to acquire and process high-resolution photos by drone in order to obtain stratigraphic architectural data at system scale, commonly impossible to carry out from the limited perspective of a single observer over large, kilometric outcrops. Once established the reliability of image quality for the recognition of lithofacies and architectural elements, this workflow should enable a rapid and logistically effective way to quantify and analyze fluvial-facies architectures from larger, panoramic photopanels. Logging and facies analysis will also provide a reconstruction of facies associations, process dynamics and controls. Sampling is scheduled in order to provide a complete compositional dataset for mineralogical characterization. Our objective is to better understand the system in a source-to-sink framework, and ultimately to obtain a correlation between proximal (Desolation Canyon, parallel to the depositional strike direction) and distal (9Mile Canyon, parallel to the downcurrent depositional direction) sections. This combined sedimentological and geochemical approach aims to unravel facies, architectural signatures and genetic trends throughout these large-scale records of a fluvial-fan system.
Peter-Lasse Giertzuch	ETHZ	2018	Combining time-lapse reflection and tomography Ground Penetrating Radar data for transport visualization in weakly fractured crystalline rock	The research project is embedded in the Grimsel In-situ Stimulation and Circulation (ISC) experiment that aims at a detailed understanding of geothermal reservoir creation processes. The proposed projects overall goal is to resolve and characterize flow paths and transport characteristics within the rock volume by the use of saline tracers and Ground Penetrating Radar (GPR). The findings will be analyzed in collaboration with hydrogeological researchers to reconstruct a Discrete Fracture Network of the test site that allows for very precise interpretation of stimulation results.	The Grant will be used to finance the visit of the applying doctoral student at the "4th Cargèse Summer School on Flow and Transport in Porous and Fractured Media“ that is held in June 2018. At the current stage of research, the geophysical processing of GPR tracer tests is developed far enough for a clear and distinct tracer visualization in the data. The next step will be the interpretation of the findings with a hydrogeological background to infer flow and transport characteristic. The Summer School in Cargèse will be an optimal introduction into the field of flow and transport. Using the information learned in the Summer School will allow for very quick advancement of the research project and provide contacts to valuable collaboration partners
Barnaby Padraig Fryer	EPFL	2018	Mitigating fluid production-induced seismicity	This research is focused on understanding the causes of fluid production-induced seismicity and then using this understanding to mitigate this seismicity. This research has applications for water and hydrocarbon production and also injection-induced seismicity, as this can, in some cases, induce seismicity by the same mechanism.	This grant is needed to fund travel to The Netherlands to help instigate collaboration and idea-exchange with Dutch research institute TNO (Netherlands Organisation for Applied Scientific Research). TNO has a large geomechanics department which has a strong focus on fluid production-induced seismicity as this is a topic that is very relevant in The Netherlands. Not only does TNO have large amounts of expertise, they also have access to large amounts of data relating to the Groningen gas field, which is a gas field which has experienced a significant amount of induced seismicity. Having access to this data would allow us to investigate and test some of the ideas that we have been working on and which are currently limited to the numerical modelling of hypothetical scenarios. For this reason we feel that this type of grant would significantly advance our research
Quinn Wenning	ETHZ	2017	Petrophysical properties of reservoir rocks - their importance to geothermal energy and crustal processes	The PhD project focuses on the laboratory characterization and development of innovative characterization methods that can be utilized in geothermal reservoir evaluation. The focus is on evaluating the petrophysical properties of fault and shear zones and developing predictive models for reservoir behavior. Specifically, one component of the thesis addresses theinfluence of 3D heterogeneity on the fluid flow properties of fractured rocks.	We have already measured hydraulic properties of fractured cores in a typical isostatic core holder (core size: 5 cm diameter, 10 cm long) with computerized tomography (CT) scans to assess 3D distribution in fluid flow properties. If we are awarded the SASEG grant, we will be able to fabricate a new core holder (see design in the motivation letter) with the capability of performing direct shear across a rough-walled fracture during combined fluid flow and CT scan experiments. A comparison of fluid flow measurements and CT scans on sheared and non-sheared fractures will give better insight to both stimulated and natural fracture behavior under reservoir pressure conditions.

Researcher	Institution	Year	Topic	Backround	Purpose of the Grant:
Karim Beguelin	Uni Geneva	2017	Reservoir characterization of the Palaeozoic rocks in the Ennedi massif region (NE Chad)	Reservoir characterization of the Palaeozoic rocks in the Ennedi massif region (NE Chad) The stratigraphic succession of the region of Ennedi (NE Chad), including continental Cambrian until the Permo-Triassic age and overlying the Proterozoic granitic gneiss basement, has been very poorly explored until today. Specifically, despite water resources have been observed at the surface, their distribution and volumetric estimation remains uncertain. Similarly, no information exists of deep subsurface hydrocarbon resources and the existence of possible active petroleum system. The nature of possible aquifer/ reservoir, seals and hydrocarbon source rock formations have never been studied before. The Ennedi massif is located in the southeastern part of the Kufra Basin, called Erdis Basin in the Chad part. A comparative approach has been carried out with Paleozoic successions of regions in Central and Eastern Sahara of surrounding areas, especially in SE Lybia, which has been much more studied because of the occurrence of oil and gas deposits, particularly the Silurian shales which are the main source rocks acknowledged in North Africa. Moreover, these Silurian deposits are exposed in the Ennedi Mountains. This study will therefore contribute to the evaluation of the geoenergy potential of the study area.	The University of Geneva has already contributed to petrographic analysis through thin sections, QEMSCAN, poro/perm and remote sensing. However, additional analyses are required to differentiate between the different Paleozoic formations. For this purpose, isotopic analysis (Nd, Sr and Pb) of 6 samples using the NEPTUNE Plus multicollector ICP-MS at the University of Geneva, will allow us to differentiate and identify for the first time the provenance of these unknown series by isotopic tracing..
Loic Pierdona	Uni Geneva	2017	Chemical stratigraphy and petrography of the Molasse in the Geneva Basin	Last year I began my master thesis on the Molasse in the Geneva basin under the supervision of Andrea Moscariello. This study is included in the Geneva 2020 Geothermal project, the aim of this program is a better understanding of the Geneva basin to valorize the ressources.	I'm doing a high resolution correlation in the Geneva basin. The analysis covered by the university include only 40 samples for the XRF (X Ray Fluorescence). These results representing the major elements and the trace elements are the key point of my work. To obtain this high resolution analysis I need 40 more XRF samples. Each additional analysis represent 50 CHF.