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ESSReS-PEP, an international and interdisciplinary postgraduate education concept on Earth and Environmental Sciences

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Promoting young researchers is a major priority of the German Helmholtz Association. Since more than five years graduate and postgraduate education in the field of Earth System and Environmental Science has been established in Bremen and Bremerhaven, north-western Germany. Using the network and collaboration of experts and specialists on observational and paleoclimate data as well as on statistical data analysis and climate modelling from two Universities and the Helmholtz research institute on Polar and Marine Research, master and PhD students are trained to understand, decipher and cope with the challenges of recent climate change on an highly interdisciplinary and inter-institutional level.

The existing research infrastructure at the Alfred Wegener Institute in Bremerhaven (AWI), University of Bremen, and Jacobs University Bremen offers a unique research environment to study past, present and future changes of the climate system, with special focus on high latitudinal processes. It covers all kind of disciplines, climate science, geosciences and biosciences, and provides a consistent framework for education and qualification of a new generation of expertly trained, internationally competitive master and PhD students.

On postgraduate level, the Postgraduate Programme Environmental Physics (PEP) at the University of Bremen (www.pep.uni-bremen.de) educates the participants on the complex relationship between atmosphere, hydrosphere (ocean), cryosphere (ice region) and solid earth (land). Here, the learning of experimental methods in environmental physics at the most advanced level, numerical data analysis using supercomputers, and data interpretation via sophisticated methods prepare students for a scientific career. Within cooperation with the Ocean University of China (OUC) students are participating one year in the PEP programme during their master studies since 2006, to get finally a double degree of both universities.

At the Alfred Wegener Institute for Polar and Marine Research in Bremerhaven, a Helmholtz Research School on Earth System Sciences ESSReS (www.earth-system-science.org) has been funded since 2007 in collaboration with the University of Bremen and the Jacobs University Bremen. ESSReS brings together up to 24 outstanding young doctoral students to conduct research on a specific topic and thus gain valuable experience working together closely in teams – an absolutely essential skill for topnotch research today. In addition, the Helmholtz Association works with distinguished partners such as the Imperial College London, enabling it to provide a curriculum that includes a range of courses that aim to foster professional qualification and personal development and to equip graduates for careers in management positions, both in science and the business world.

The set-up of a structured doctoral programme like ESSReS combines both, strong scientific cutting-edge research and an interdisciplinary education that bridges the gap between the traditional disciplines. The young students are motivated to learn on an interdisciplinary and trans-institutional basis, guiding their way in modern research. The success and outcome of the first 3-years phase of ESSReS and its structural framework is documented in the Springer book series “SpringerBriefs in Earth System Sciences” (http://link.springer.com/book/10.1007/978-3-642-32235-8/page/1). Together with the graduate school POLMAR at the Alfred Wegener Institute, ESSReS provides a new level with binding rules for doctoral education at the Alfred Wegener Institute, satisfying the enduring efforts on the improvement of doctoral education in the Helmholtz Association.