Paul Scherrer Institut (PSI), Germany

The **Paul Scherrer Institute PSI** is the largest research institute for natural and engineering sciences within Switzerland. We perform cutting-edge research in the fields of matter and materials, energy and environment and human health. By performing fundamental and applied research, we work on sustainable solutions for major challenges facing society, science and economy. PSI is committed to the training of future generations. Therefore about one quarter of our staff are post-docs, post-graduates or apprentices. Altogether PSI employs 2100 people.

FPGA Development Group

Electronic Engineer

FPGA Developer

Your tasks

The FPGA Development group participates in design and development of measurement and control systems for particle accelerators. Your tasks will be:

- Working out concept for firmware and software implemented in system on chip (SoC) for various accelerator subsystems
- Development, verification, and commissioning of applications based on Xilinx FPGA
- Debugging, tests and characterization of digital hardware including A/D and D/A converters
- Close collaboration with software engineers, hardware providers and project leaders
- Support for running systems and other FPGA developers

Your profile

- University degree in electronics
- Experience in programming, simulation and implementation of FPGA projects using VHDL
- Extensive experience in using FPGA development tools such as Xilinx Vivado, ISE / EDK and ModelSim
- Good knowledge of digital signal processing and control theory
- Experience in programming with C / C++, Python and Matlab
- Good knowledge of German and English
- Knowledge of hardware standards and bus systems, such as MicroTCA, VME and CPCI-S
- Knowledge of FreeRTOS or other real-time operating systems would be an asset

We offer

Our institution is based on an interdisciplinary, innovative and dynamic collaboration. You will profit from a systematic training on the job, in addition to personal development possibilities and our pronounced vocational training culture. If you wish to optimally combine work and family life or other personal interests, we are able to support you with our modern employment conditions and the on-site infrastructure.

For further information please contact Dr Waldemar Koprek, phone +41 56 310 37 65.

Please submit your application online for the position as an Electronic Engineer (index no. 8221-00).

Paul Scherrer Institut, Human Resources Management, Melanie Rapisarda-Bellwald, 5232 Villigen PSI, Switzerland.
Apply online now

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Radiation Transport and Multiphysics Group

Physicist or Nuclear Engineer

Your tasks

You will perform advanced Monte-Carlo particle transport simulations with MCNP 6 and/or MCNPX 2.7.0 needed for the operation of PSIs High Intensity Proton Accelerator Facility (HIPA), the spallation neutron sources SINQ and UCN at PSI as well as for current and future development and upgrade projects such as SwissFEL and SLS 2.0. Typical examples of these tasks include optimization of the performance of a target station within given constraints, designing shielding using variance reduction methods, calculation of dose rate maps of extended geometries that have to be composed from technical drawings or similar. Other tasks are requested by the Swiss authorities, e.g. for the disposal of radioactive waste, and reports have to be handed in. For these tasks, in-house developed state-of-the-art systems, programs, tools and patches for MCNP(X) source code already exist that you will tailor for the needs of our applications and migrate to higher versions of MCNP. At internal and international expert meetings you will present your results.

Apply online now

Your profile

You are a nuclear engineer or Nuclear/Particle Physicist, with a PhD, well experienced in advanced radiation transport calculations using MCNP(X) and eligible for the MCNP(X) source code license, and having a good understanding of the nuclear physics behind. You have skills in coding of challenging calculational models with demanding geometries, profound knowledge of variance reduction techniques and programming. Fortran, C on parallel CPU's, Python and Perl are of advantage. Moreover you are able to work self-reliant and time efficient in small expert groups as well as in international and multidisciplinary teams towards solving given tasks. It is expected that you are a well-balanced person, communicative, innovative and open-minded for new ideas. You have a good command in written and spoken English; ideally you are also able to speek and write German.

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For further information please contact PD Dr Daniela Kiselev, phone +41 56 310 30 37.

Please submit your application online (including list of publications and addresses of referees) for the position as a Physicist or Nuclear Engineer (index no. 8142-00).

Paul Scherrer Institut Human Resources Management, Melanie Rapisarda-Bellwald, 5232 Villigen PSI, Switzerland

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Low Level Tools und Controls Core Group

Embedded Software Engineer

Control system and embedded development

Your tasks

Development, test and implementation of timing and event, BSDAQ and/or other control system software for the SLS 2.0 Project. This includes (but is not limited to) development and maintenance of device and EPICS drivers, EPICS DB, client software, interfaces, tools, GUIs and similar

Development and integration of timing and event system on all sub-platforms included in the PSI NPP (Next Processing Platform), for example on Compact PCI Serial, Zynq Ultrascale SOC/SOM and similar

Support for section and department for the development of event-synchronous transfer and storing of data from various sources (EPICS IOCs and other sources) for the SLS 2.0, based on DAQ (BSDAQ) system used in SwissFEL

Further development and maintenace of Linux, Windows, VxWorks and other kernel and EPICS drivers, tools, DBs and GUIs on all supported platforms and operating systems (Linux, Windows, VxWorks…)

Creation and maintenance of software and other documentation

Your profile

- Higher degree in informatics, electronics, electrotechnics, physics, mathematics or in a similar domain

- Excellent knowledge of C and C++, Device Driver and Kernel-level development, development for soft and hard real-time systems and development for resource-constrained systems
- Extensive experience with development for embedded platforms, various operating systems (Linux, VxWorks, Windows,…) and CPUs (Intel family, ARM Family, PowerPC family, etc.)
- Experience with development of drivers and tools that communicate directly with hardware
- Extensive experience with cross-platform development and build tools on Linux/Unix
- Fluent in English, knowledge of German is a plus
- Team player with excellent communication skills
- Knowledge of large research facilities and especially particle accelerators and related control systems, such as EPICS, is a plus
- Knowledge and experience in development for PREEMPT-RT based Linux kernels is a plus
- Knowledge of FPGA and FPGA/related develpoment (VHDL) is a plus
- Expert knowledge and experience in Linux Kernel and file system builds, creation and maintenance of Linux BSPs is a plus
- Expert knowledge and experience in low level Windows development (device drivers and similar low level software) is a plus
- Experience with development for other operating systems, such as VxWorks, FreeRTOS, etc. is a plus

We offer

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This is a fixed-term position. The employment contract will (initially) be limited to 3 years.

For further information please contact Dragutin Maier-Manojlovic, phone +41 56 310 40 23.

Please submit your application online for the position as an Embedded Software Ingenieur (index no. 8211-01).

Paul Scherrer Institut, Human Resources Management, Melanie Rapisarda-Bellwald, 5232 Villigen PSI, Switzerland

Apply online now