INTERNSHIP OFFER
CH-2025-000069

Villigen PSI, Switzerland | ON-SITE

INTERNSHIP HOST

Name of Company
Paul Scherrer Institut

Website
www.psi.ch

Address of Company
Villigen PSI
Switzerland

Number of Employees
2300

Business or Product
Research

STUDENT REQUIRED

General Discipline
Chemistry and Chemical Engineering

Field of Study
Inorganic Chemistry

Completed Years of Study
2

Language Required
English Excellent (C1, C2)

Required Qualifications and Skills

Practical experience in a chemical laboratory; Fundamental understanding of Electrochemistry

Student Status Requirements
Enrolled during whole internship; with EU/EFTA passport also possible between BSc and MSc

Other Requirements/Information

INTERNSHIP OFFER

8 - 26 weeks

Latest Possible Start Date

Within Months
Jun-2025 - Dec-2025

Company Closed WIthin
-

2100 CHF per Month

Deductions Expected
approx. 10 % Social security AHV/IV

Payment Method

900 CHF per Month

Arranged by
Employer

Estimated Cost of Living including Lodging
1750 CHF / Month

Working Environment: Research and development

Working Hours / Week: 40.0

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 future technologies, energy and climate, health innovation and fundamentals of nature. 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 2300 people.

Project: Enabling zero-excess Li metal anodes in next generation all-solid-state batteries using functional nanolayers
The development of all-solid-state batteries has attracted a lot of attention in the past decade due to their enhanced safety and impressive energy density reaching up to 500 Wh/kg when combined with Li metal anodes. Recently, the implementation of zero-excess Li metal anodes has shown potential to further increase volumetric energy density while reducing production costs. Those kinds of anodes are not using a reservoir of Li metal but consists of only a current collector where the Li ions from the cathode material are plated in situ during the initial charge. Despite these advantages, this system suffers from very low coulombic efficiencies due to the formation of dead Lithium and internal short circuits by Li filament growth caused by the irregular plating of Li metal on conventional copper current collectors. To address these challenges, sub-micron thick functional layers consisting of a nucleation and barrier layer have shown significant potential to improve the homogeneity of Li metal suppressing filament growth and minimizing side reactions. Therefore, the project focuses on the designing of different functional layers on conventional copper current collector for all-solid-state batteries to improve the cycle life. In a first-place various functional layers are prepared on copper current collector using physical deposition techniques such as DC/RF sputtering or E-beam evaporation. Second, these layers are thoroughly characterized by advanced methods, including SEM/EDX and XPS. Furthermore, these layers are tested electrochemically against Li metal or conventional cathode using solid-state electrolyte. Testing methodologies will include galvanostatic cycling, electrochemical impedance spectroscopy and cyclic voltammetry to characterize their electrochemical properties and performance improvements.

ADDITIONAL INFORMATION

Any student with Non-EU/EFTA nationality needs an official letter from their university, confirming that the internship is compulsory (required for visa/work permit).

Deadline for Nomination - 15-Mar-2025

Date - 22-Jan-2025

On Behalf of Receiving Country - IAESTE Switzerland