



As a strategic partner of ETH Zurich, inspire AG conducts research for the industry, develops state-of-the-art technologies, methods and processes and solves problems in areas of product innovation and production technology. At the ICS (innovative composite structures) group cutting-edge researches on composite materials are carried out to find new lightweight and sustainable solutions for industrial applications.

## **Internship opportunity at Inspire (ICS group) to develop a laboratory line for the pultrusion of continuous fiber reinforced polymer wires and subsequent manufacturing process for the production of strands**

### **Project**

Together with an industrial partner, Inspire has established a unique laboratory line for manufacturing CFRP wires with thermoplastic matrix systems in a continuous pultrusion process allowing the combination of different materials and local orientations of the fibers within the wire (local wire designs). By the optimization of these material and local design parameters we strive for manufacturing thermoplastic FRP wires that can easily be shaped at elevated temperatures without disintegration. Nevertheless, these wires are expected to have in longitudinal direction a mechanical performance that still is close to the outstanding properties of unidirectional CFRP. The pultruded CFRP wires shall be assembled to wire strands, for which a dedicated line is planned to be established.

### **Your Task**

- improvements of the laboratory line for wire production
- testing new combination of materials for matrix and fibers in the production of wires
- mechanical tests of the pultruded wires
- quality evaluation through cross section analysis of the pultruded wires
- tuning of the process parameters to increase the wire quality and mechanical performances
- design and construction of the new lightweight strand production line

### **Your Profile**

- mechanical engineering or material science student
- understanding of composite materials
- experience with experimental mechanical testing
- CAD skills
- suited for practical work
- understanding of electronics (e.g. servomotor / stepper control) is a plus
- programming with beckhoff software is a plus

### **Period**

Starting April/May 2022 for 5-6 months

### **Contact Details**

If you are interested, please send an email to Daniele Rocco ([rocco@inspire.ethz.ch](mailto:rocco@inspire.ethz.ch)) with your cv