

ICB PhD public presentations**AGILE DEVELOPMENT OF
CHEMICAL DEVICES: DESIGN
ITERATIONS, CONSUMER
ELECTRONICS AND RAPID
PROTOTYPING****Michele Gregorini**

ICB / Functional Materials Laboratory
Supervisor: Prof. Dr. Wendelin Stark
Co-examiner: Prof. Dr. Paolo Arosio



ETH Hönggerberg, 11/09/2019
HCI J 143, 14.00 h

Project Summary: Chemical devices are tools able to measure, make or purify chemicals on a small scale, such as in the case of pregnancy tests or laboratory equipment. This work presents the rapid development of three small and cost-effective chemical devices achieved by combining basic principles of chemical product designs, easily available consumer electronics parts and rapid prototyping techniques such as 3D printing. The first device is a fast, stand-alone and ready-to-use quantitative PCR machine fabricated from inexpensive and off-the-shelf components. The second devices combines a commercial DLP projector with a potassium ferrocyanide solution in a one-step photolithographic system that can be used to pattern structures onto gold-coated surfaces. Finally, we demonstrate a simple device able to produce microfluidic patterns in short time by selectively curing a photosensitive resin by means of a small light source combined with a modified LCD screen used as a photomask.

CV. Michele Gregorini graduated from ETH Zürich with a MSc in Mechanical Engineering in 2016 after obtaining his BSc from Politecnico di Milano (2012). In parallel to his studies, he gained industry experience in the R&D sector of Turboden (IT) and VastSolar (AUS) for overall more than one year. In 2016, he started his doctoral studies at ETH Zürich under the supervision of Prof. Dr. Wendelin Jan Stark.