




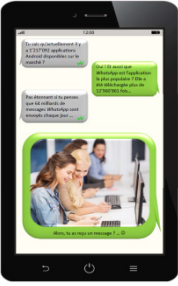
# Summer school of the MINT- class from the Gymnasium Köniz at EPFL – 2018


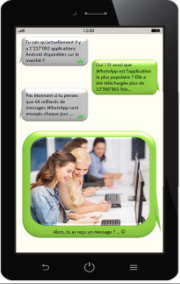

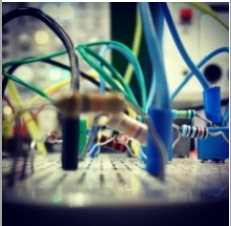
## Program (30 Participants)

Monday July 2	Tuesday July 3		Wednesday July 4		Thursday July 5		Friday July 6
10:15 – 12:00 Welcome SPE	09:00 11:45		09:00 11:45		09:00 11:45		Holidays
	Module 1: <b>Materials science 1</b>	Module 2: <b>Microfabri- cation</b>	Module 1: <b>Computer science</b>	Module 2: <b>Robotics</b>	Module 1: <b>Space center</b>	Module 2: <b>Structures in civil engineering</b>	
Lunch	Lunch		Lunch		Lunch		
13:15 – 16:00	13:15 – 16:00		13:15 – 16:00		13:15 – 17:00		
<b>Physics</b>	Module 1: <b>Robotics</b>	Module 2: <b>Computer science</b>	Module 1: <b>Environ- mental eng.</b>	Module 2: <b>Electrical &amp; electronic eng.</b>	Module 1: <b>Materials science 2</b>	Module 2: <b>Life sciences IGem – Project</b>	
	Closing event						

<b>Monday, July 2</b>	10:15	Meeting point : Esplanade
	10:20 – 12:00	<b>Welcome / Maya Frühauf</b> - Introduction to EPFL (CO 015) Campus tour (Alexander Karpushov)
	13:15	Meeting point : Room PH C1425
	13:15 – 16.00	<b>Physics</b> <b>Dr Daniele Mari</b> Build a vacuum installation and measure the electric resistance of a superconductor (résistance =0) in liquid nitrogen. Establish the resistance - temperature curve of this material.



<p>08:55</p>	<p>Meeting point : Module 1: Entrance MX F1 Auditorium Module 2: Entrance Building BM - middle</p>
<p>Module 1</p> 	<p><b>Introduction: Materials world? Prof. Holger Frauenrath</b></p> <p><b>Metals and alloys, how to build a phase diagram</b> Cyril Dénéréaz</p> <p><b>3D printing</b> Dr Pierre-Etienne Bourban, MER</p>
<p>Module 2</p> 	<p><b>Microfabrication</b> <b>Dr Adrien Toros</b></p> <p>In this module, the students will follow a simple microfabrication process on a silicon wafer using the cleanroom facilities of the EPFL Center of MicroNanoTechnology (CMi).</p>
<p>13:15</p>	<p>Meeting point : Module 1: Building MED 2<sup>nd</sup> floor Module2: Entrance Hall building BC</p>
<p>Module 1</p> 	<p><b>Robotics</b> <b>Prof. Francesco Mondada</b></p> <p>The students will simulate the access to a distant robot (in another room), as if it was located on another planet, in a place of an environmental disaster, or very tiny inside the body of a person.</p> <p>The participants will learn how to use a robot connected to their computer to understand the reactions, the sensors and the actuators, and then connect to the distant one and use what they have learnt to perceive its environment.</p> <p>All these operations will be done with Thymio, a robot developed at EPFL-</p>
<p>Module 2</p> 	<p><b>Computer science</b> <b>Dr Barbara Jobstmann</b></p> <p>The students will learn about the life of an app and how to create their own (Android) phone apps.</p>

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<p>13:15</p>	<p>Meeting points - Module 1: Entrance Building GR 2<sup>nd</sup> floor Module 2: MED 2<sup>nd</sup> floor</p>	
<p>Module 1</p> 	<p><b>Environmental engineering</b> <b>Dr Felipe De Alencastro, Dr Hendrik Huwald</b></p> <ul style="list-style-type: none"> <li>• General introduction to the research done in the field related to the hands-on activities</li> <li>• The participants <b>move to the river "la Sorge"</b> Measurement of the flow of the river with various techniques, and measurement of different parameters (water infiltration, ground humidity ..., chemical analyses -pH, conductivity...)</li> </ul>	
<p>Module 2</p> 	<p><b>Biomedical technology</b> <b>Cédric Meinen</b></p> <p>Construction of a device for the optical measurement of the heart pulse. It will be done in successive stages.</p> <ul style="list-style-type: none"> <li>• Infrared detector (transmitter - receiver)</li> <li>• Filter (simulation of its characteristic feature)</li> <li>• Optical measurement of the heart pulse (combination of all elements)</li> </ul>	

08:55	Meeting points Module 1: Entrance Building BC Module 2: Entrance Building GC, 2 <sup>nd</sup> floor
<p>Module 1</p> 	<p><b>Orbital Debris</b> <b>Swiss space Center / Yannick Delessert et Martine Harmel</b></p> <p>In this module, we will look at the issue of waste in the Universe (Orbital Debris). In small groups, the students are going to look for possible solutions bringing their own creativity. We will explain draft solutions that are being developed at EPFL. In the second part of the module, the students will have the possibility to catch satellite models using remote-controlled drones, in order to familiarize themselves with the challenges of space debris removal. This last part will be organized in a form of competition.</p>
<p>Module 2</p> 	<p><b>DESIGN A SEISMIC-Resistant Building</b> <b>Prof. D. Lignos, Mr. Alexander Hartloper, Dr. Albano Sousa</b></p> <ul style="list-style-type: none"> <li>• General introduction to design of structures to withstand vertical and horizontal loads.</li> <li>• <b>The challenge</b> : by groups of two or three, the goal is to design a 3 storey building using the MOLA™ structural kit, with a given number and type of pieces. The buildings will be subjected to the El centro and Northridge earthquakes, and should be able to withstand them !</li> </ul>
13:15-16:00	Meeting points Module 1: MX F1 Auditorium Module 2; MED Building Entry , then MED 3 1519
<p>Module 1</p> 	<p><b>Introduction: Materials world Prof. Holger Frauenrath</b></p> <p><b>Discovering the fabrication and assembly of complex fibers</b> Ines Richard, PhD student</p> <p><b>Process, characterize implants and biomaterials for the spinal column</b> Céline Wyss, PhD student</p>
<p>Module 2</p> 	<p><b>Brief overview of synthetic biology</b> <b>Students of the iGEM-team 2018</b></p> <p>General introduction into synthetic biology and the international competition iGEM. Participants will get the chance to perform simple experiments in the laboratory and design their own project</p>
<b>Closing event</b>	Thursday 16:15 – 17:00