



Presentation of the master specialization: **Materials and Mechanics**

Prof. Ingo Burgert

Institute for Building Materials, ETH Zurich

→ ifb.ethz.ch/education

Major in Materials and Mechanics (from HS 2020 on)

	Technology	Research and Development	Modelling and Simulation	
1 st semester (HS)	Advanced Building Materials Concrete Technology Moisture Transport in Porous Media	Flatt, Burgert 2V; 4KP Constandopoulos, Bäuml, Martinola 2G; 2KP Mechanics of Composite Materials Carmeliet, Kubilay, Zhou 2G; 3KP	Numerical Mechanics of Materials Kress, Ermanni 2V+1U; 4KP	Kammer, Wittel 2V+1U; 4KP Σ17KP
2 nd semester (FS)	Concrete Materials Science Wood Physics & Wood Materials NDT & Health Monitoring	Flatt, Wangler 2G; 4KP Burgert, Zimmermann 2G; 3KP Burgert, Angst 2G; 3KP Building Materials and Sustainability	Scientific Programming Method of Finite Elements 1 Habert 2G; 3KP	Kammer 2G+2U; 4KP Chatzi, Steffen 2G; 4KP MaP Distinguished Lecture series on Additive Manufacturing Schefer, Meboldt, Studart 2S, 1KP Σ22KP
3 rd semester (HS)	Structures of Wood and Function Shrinkage and Cracking of Concrete Durability and Maintenance of RC Science and Engn of Glass and Natural Stone in Construction Fundamentals of Wood Elaboration and Woodmachining	Burgert, Zürcher 2G; 3KP Lura, Wyrzykowski 2G; 3KP Angst, Elsener 2V; 4KP Wittel, Wangler 2G; 3KP Burgert, Schubert 2G; 3KP	Method of Finite Elements 2 Particle Methods in Engineering** Wittel, Wangler 2G; 3KP	Chatzi, Abbiati, Agathos 2G; 3KP **Wittel 2G; 3KP Σ19KP

24 KP required in specialization

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Alumni Profiles:

Technology



- Material design
 - Concrete formulation (tailor design)
 - Material testing
 - Knowing who to ask, understanding answers, deciding, getting it done
- Durability
 - On site diagnosis
 - On site monitoring
 - Prescription
- Job examples
 - Technical marketing
 - Technical *gourou* (in large companies)
 - Independent expert/consultant

A. Bertoncini; dipl. Bauing. ETH
Technischer Berater bei TFB AG (Technische Forschung und
Beratung für Zement und Beton) Wildegg, Ag

Zürich Hardtbrücken Sanierung 2010



April 14th 2018, RJ Flatt



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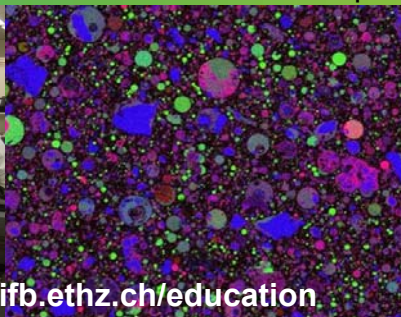
Alumni Profiles:

Research and Development



- Research
 - Understanding what happens
 - Defining what to do
 - Experimental focus
- Development
 - Innovation
 - Material testing
- Job examples
 - R&D labs of material producers (ex: Holcim, Sika, Trösch)
 - Technical marketing
 - University or institutional research
 - Spin offs??

Philippe Jost, Dipl. Bauing. ETH
Senior Vice President Business Unit Concrete and
Head New Market Development of Sika Services AG



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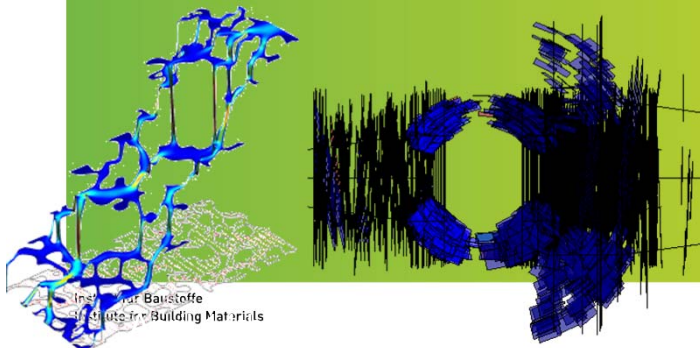
Alumni Profiles:

Modeling and simulation



- Comprehension
 - Physical phenomena (not accessible by experimentation)
 - Coupled phenomena
 - Team work with experimentalists
- Prediction
 - Durability involving coupled phenomena
 - Long term stability (ex: nuclear power plants)
- Job examples
 - University or institutional research
 - Large engineering bureau
 - Specialized engineering service
 - Spin offs??

dipl. bauing. ETHZ Andrea Pedretti
Entreprises: Airlight Ltd / Airlightenergy
Chief Technology Officer / structural design



Good reasons to choose M&Ms

1. It's fun
2. You're interested in broadening your scientific culture in a **multidisciplinary** context

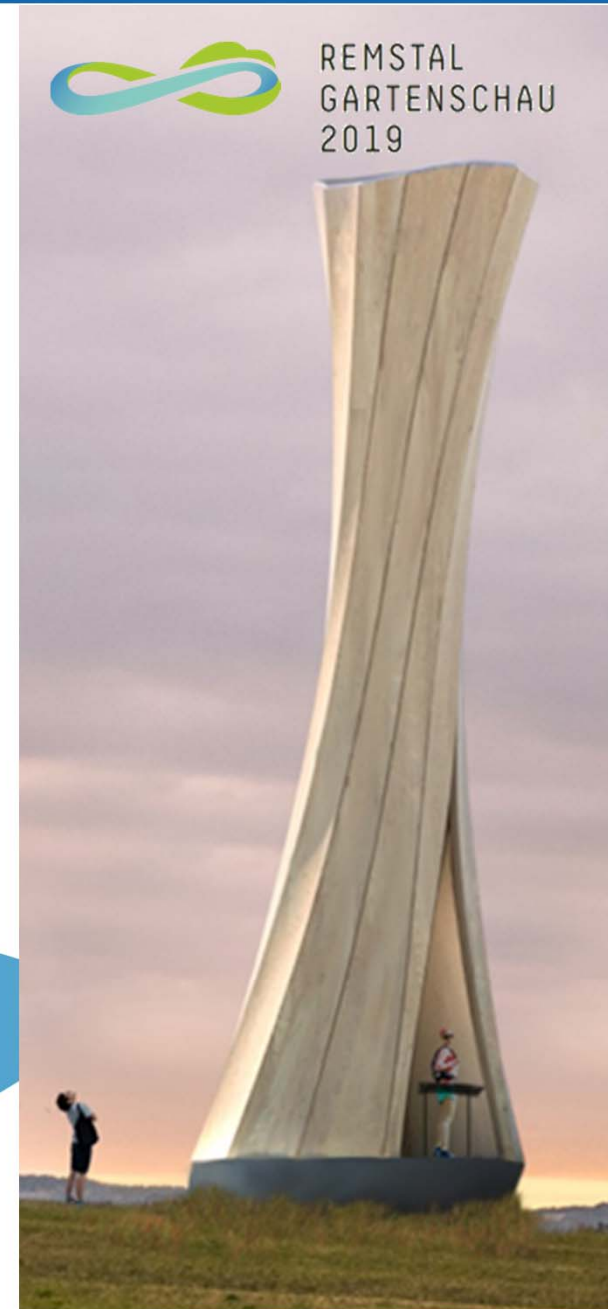
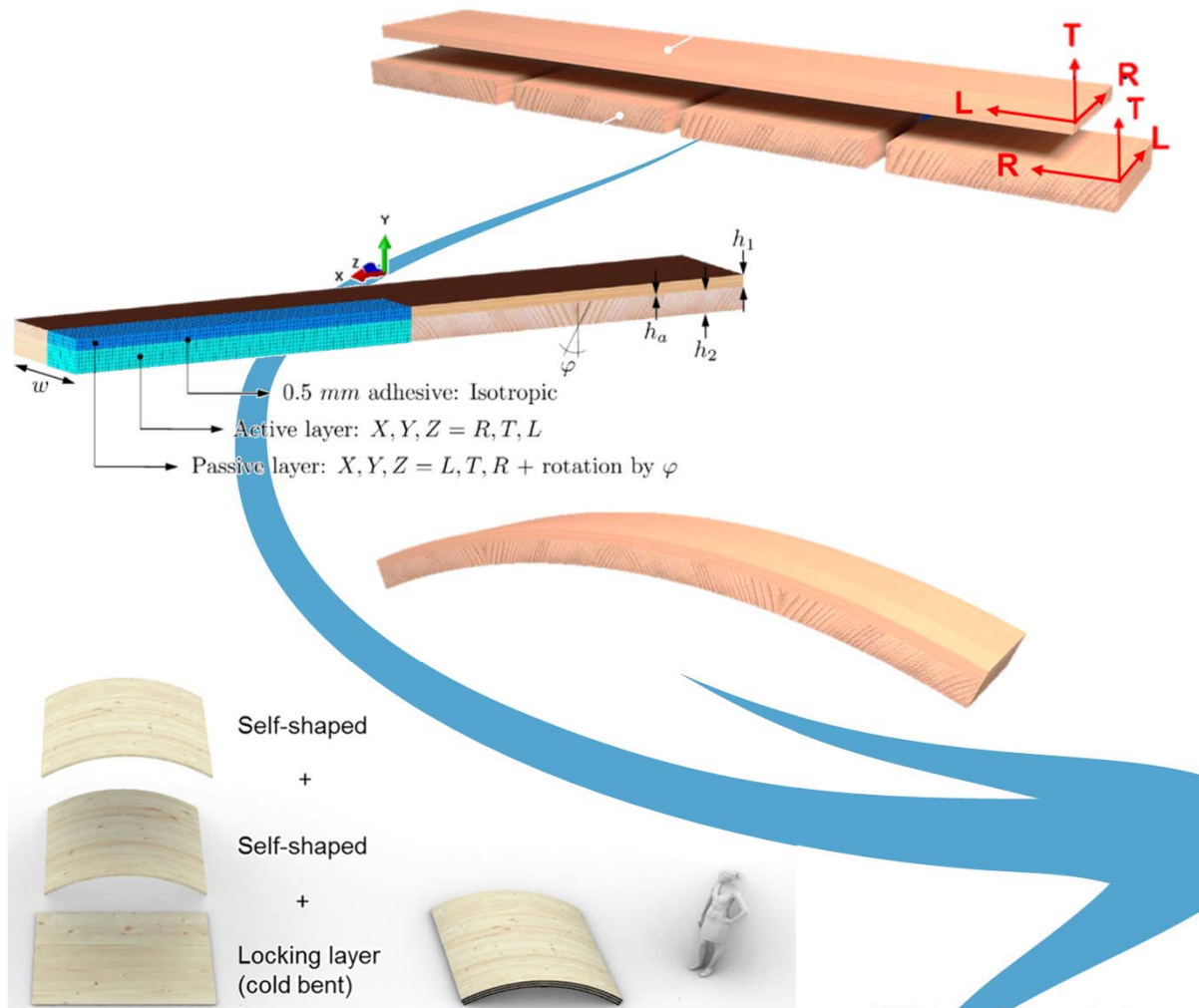
Diverse expertise



Good reasons to choose M&Ms

1. It's fun
2. You're interested in broadening your scientific culture in a multidisciplinary context
3. You believe materials are a vector for innovation

Innosuisse project: Large-scale wood bilayers



Good reasons to choose M&Ms

1. It's fun
2. You're interested in broadening your scientific culture in a multidisciplinary context
3. You believe materials are a vector for innovation
4. You want to become the greatest civil engineer ever
5. You want to save the world
6. You want to be able to judge tomorrow's materials

swiss **wood** solutions

A Technology Developing and Solution
Providing Company for ...

... Wood Materials and Applications

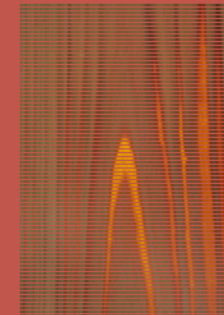
Sonowood



Fire retardant
wood



Translucent
wood



Convinced about M&M's?

