

Alberta Technical University of Munich



ATUMS



Graduate School for Functional Hybrid Materials

Contact:

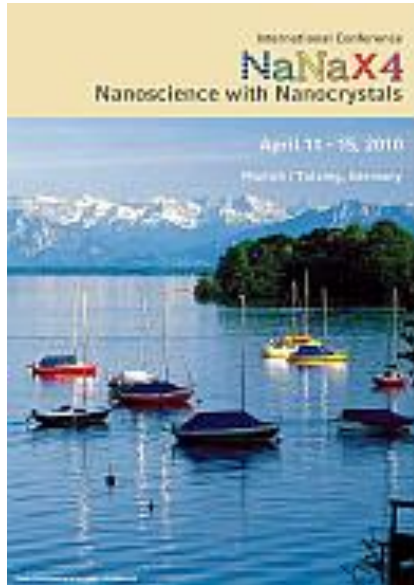
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Canadian Program Coordinator: Leah Veinot veinot@ualberta.ca

uab.ca/ATUMS

How did it all begin?

April 11–15, 2010



Eruption of Eyjafjallajökull
April 14, 2010



All air traffic in EU airspace
April 15 – 20, 2010.



Veinot Sabbatical at **TUM** 2012-13



Alberta Technical University of Munich



Our Objectives

1. To **train** Canada's next generation of leaders in hybrid functional materials with a focus on efficient energy storage.
2. To **develop** a cohort of Canadian researchers with an international view of research and world-class research excellence training.
3. To **enhance** international cooperation in material science research (in particular with Germany).
4. To **foster** a group of researchers with international contacts in nanomaterial science and device fabrication.
5. To **train** students to be leaders in academia, government, polymer/materials chemistry industries and/or to work in the energy, optics, and microelectronics industrial sectors, or as entrepreneurs.

Build a community and network!
- The “ATUMS Family” -

Financial Support for ATUMS



NSERC – CREATE



Alberta Innovates – Strategic Projects



**Canada First Research Excellence Fund
(Future Energy Systems)**



University of Alberta

Vice President Research and Innovation
Faculty of Science
Faculty of Graduate Studies
Chemistry Department



German Research Foundation – IRTG

**Technical University of Munich
IGSSE**





ATUMS is a joint initiative of the University of Alberta and Technische Universität München that provides **international** and **interdisciplinary** training of elite scientists and engineers.



The ATUMS INTERNATIONAL TEAM



ATUMS Canada “By the Numbers”

- **80** Canadian trainees total (since April 2015)
- **27** Canadian Students (currently)
- **11** Canadian trainees graduated (3 more imminent)
- **9** Canadian ATUMS faculty members
- **38** Research Exchanges completed (as of March 2020)
- **229** Journal articles
- **2** Patents
- **2** Spin-off Companies
- **368/119** conference presentations/posters
- **109** Awards/Scholarships
- **100 %** Employment Rate 6 months post graduation

Students and the ATUMS Program (Canada)

U of A Departments: Chemistry, Physics, Electrical & Computer Engineering

Language of instruction: English

Enrollment: Approximately 11 incoming students per year (excluding scholarship students).
Current Canadian Enrollment: 45. Current German Enrollment: 18.

Chemistry Student TA Responsibilities: Yr. 1 full load; Yrs 2 and beyond decreased load, possibility of complete buy-out for top candidates

Academic Courses: Standard departmental requirements.

Short Courses: Technical (M.Sc. 3; Ph.D. 6) and Soft-skills (M.Sc. 3; Ph.D. 6)

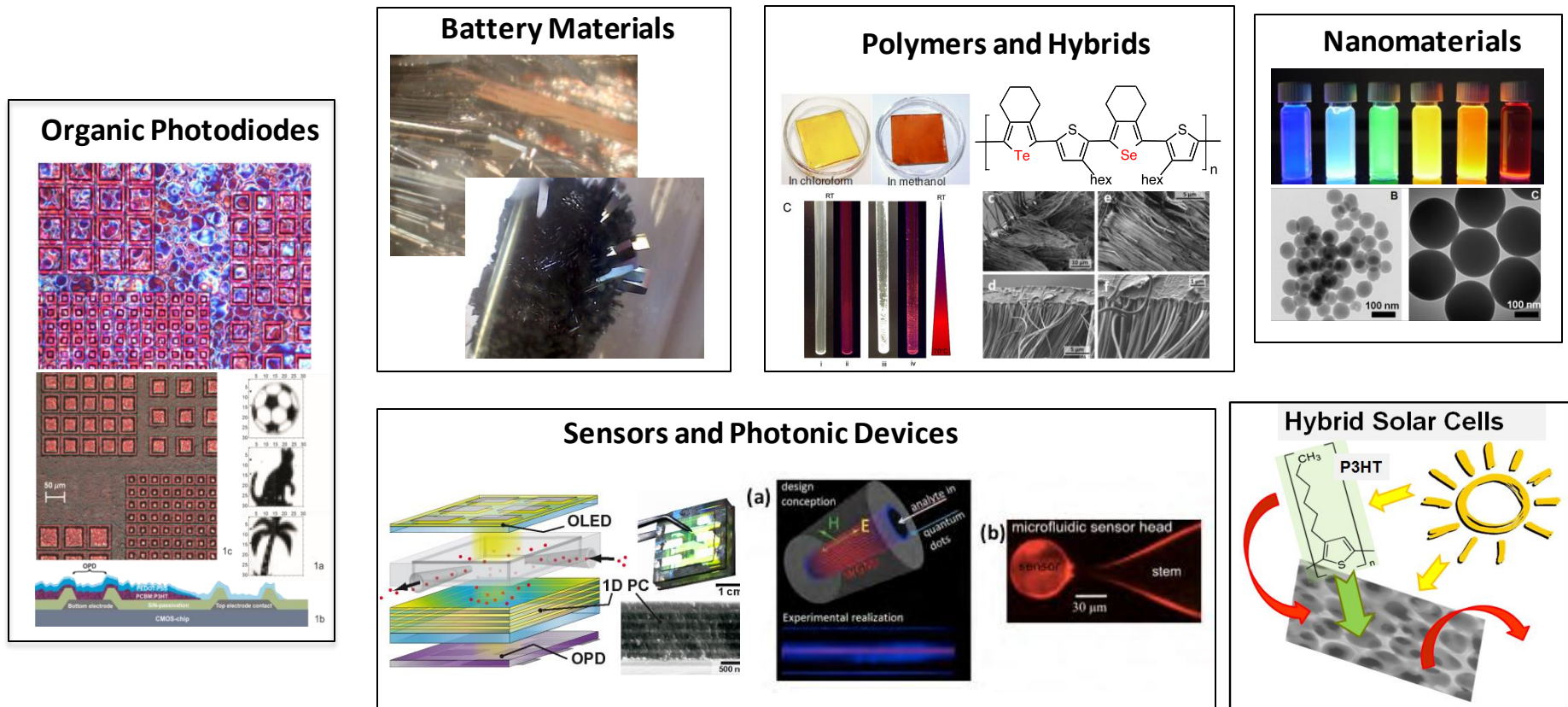
Travel requirements: 1 x 3 months M.Sc.; 2 x 3 months Ph.D.

Supervision: Joint (interdisciplinary/international supervision)

Target Time In Program: 2.5 (M.Sc.) and 4.5 (Ph.D.) years

Scientific Scope of ATUMS

ATUMS researchers are targeting projects related to hybrid functional materials with applications in efficient energy management.



Expertise includes nanomaterial, polymer, inorganic and solid-state chemistry, catalysis, optics, ultra-fast spectroscopy, electronics, as well as device design and fabrication.

Students and the ATUMS Program



Hands-on training (Canada)

Technical short courses will be offered in collaboration with experts at the UofA Nanofab. e-beam lithography, CVD and PVD, LPCVD and PECVD deposition, deep Si etch processes, micro/nano embossing, XPS, TOF-SIMS, cleanroom protocols, and a He ion microscope.

Students and the ATUMS Program

Canadian Course Offerings



Academic Courses (Selected, Subject to Availability)

Polymer Chemistry, Synthesis and Applications of Inorganic and Nano-materials, Solid-State Chemistry, Characterization Methods in Nanoscience, X-ray Crystallography, Organic Electronics, Introduction to Microelectromechanical Systems

Canadian Short Course Offerings (Selected, Subject to Availability)



Nanomaterial Synthesis and Applications, Solid-state Synthesis/Characterization, Thermoelectric materials, Polymer Design and Synthesis, Photoactive Hybrid Functional Materials, Design, Evaluation, and Application of Photonic Structures, Principles and Applications of Ultrafast Spectroscopy, Canadian Patent Law, **Innovation and Business Workshop, Business Basics for Innovators, Scientific Ethics.**

Selected German Short Course Offerings



Professional Presentation Skills, **Project Management**, Overcoming Obstacles and Developing New Ideas, **Conflict Management**, Basics in Business & Administration for Scientists, Scientific Writing, **Job Application Preparation**, Diversity in the Workplace, International Patent Law, and Intellectual Property Management, **CV preparation.**

Specialized/Individualized Professional Development



ATUMS Students and TUM IGSSE



TUM Science & Study Center
Raitenhaslach (Burghausen)



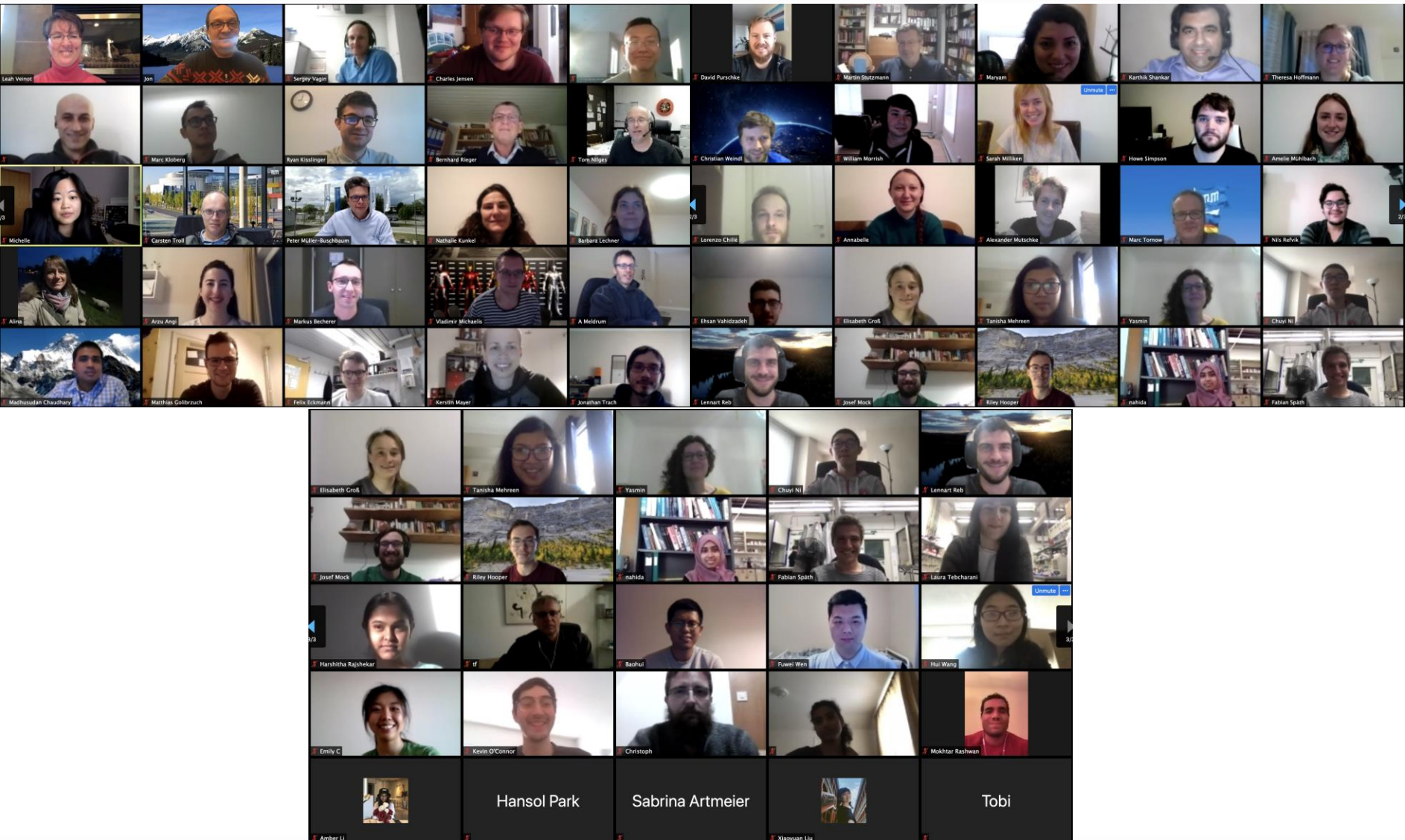
Annual Meetings - International Networking



UNIVERSITY OF
ALBERTA



Annual Meetings - International Networking





**Experience living and working in
a different country.**

MSc 3 months; PhD 6 months



ATUMS Passport to Innovation



Upon completion of degree requirements ATUMS Graduates receive the ATUMS Passport to Innovation.



UofA Students on ATUMS



Dr. Mita Dasog

Dr. Dasog and her team received the best presentation award at an IGSSE Retreat. She was honored by the German government with a 2013 “Green Talents” award. **She is currently a Professor at Dalhousie U.**



Dr. Zhenyu Yang

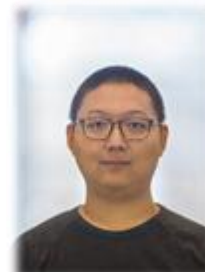
Dr. Yang is currently a **Professor at and 100 Talents Award Winner at Sun-Yat Sen University**

They are convinced that ATUMS:

“provided them with a global perspective not available through long-distance collaborations”, “built their international professional network”

“broadened the impact of their research”.

“broadened my professional network and made me realize how important a Ph.D. is to my career targets”



The ATUMS scope of Influence.

Facilitated a joint UofA – TUM Ph.D. Program – Every UofA Faculty of Science Graduate Student has an opportunity to pursue a joint Ph.D. degree.

Established a state-of-the-art P.D. Program adopted by the UofA Chemistry Department and provided a basis for the P.D. requirements of the UofA Faculties of Science and Graduate Studies Programs.

Established a Community of no less than 100 Professionals.

Two successful Spin-off Companies arose directly from ATUMS research and currently are led by and/or employ ATUMS graduates.

ATUMS has provided a foundation on which no fewer than two successful CREATE Programs.

ATUMS started in 2015 as a 5-year program... we have successfully secured funding through 2024 and are working to extend our timeline .

The tough questions.

Would I do it again?..... YES!!!

What would I do differently?....

- define more narrow research priorities
- assign more operational tasks to the other PIs and the HQP

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