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## PROFILE

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Masters in Physics & Business Management	Bachelors in Mechanical Engineering
Leadership & Management Experience	Multi-Cultural & Multi-National Experience
5 years Research Experience	3 years Industry Experience
Designer, Builder, & Science Savvy	Quick to Learn New & Challenging Concepts

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## EDUCATION

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### **Victoria University** Wellington, New Zealand

[www.vuw.ac.nz](http://www.vuw.ac.nz) | Aug. '11

M.Sc., Physics by Thesis  
Recipient of a Fulbright US Graduate Student Scholarship

*Research was a part of the World-Class MacDiarmid Institute for Advanced Materials & Nanotechnology.*

### **Babson College** Babson Park, MA, U.S.

[www.babson.edu](http://www.babson.edu) | May '08

M.Sc., Business Management, Concentration in Technology Entrepreneurship  
Recipient of a US\$20,000 Goldman Sachs / Matsuo Takabuki Commemorative Scholarship

*Babson is highly ranked for Entrepreneurship in the U.S.*

### **Franklin W. Olin College of Engineering** Needham, MA, U.S.

[www.olin.edu](http://www.olin.edu) | May '07

B.Sc. in Mechanical Engineering, GPA 3.85/4.00  
Recipient of a four-year full tuition and room scholarship valued at US\$160,000  
Part of the 2<sup>nd</sup> graduating class from this new school

*Olin Reinvented the Engineering Education through a project-based, team-based, and "do-learn" curriculum.*

*Olin is among the Top Undergraduate Engineering programs in the U.S. and is Highly Selective.*

*Olin College seeks to redefine engineering as a profession of innovation encompassing 1) the consideration of human and societal needs; 2) the creative design of engineering systems; and 3) the creation of value through entrepreneurial effort and philanthropy.*

### **The University of Waikato** Hamilton, New Zealand

[www.waikato.ac.nz](http://www.waikato.ac.nz) | Jun. '06

Study abroad experience. Studied theatre, Māori language, and biology.

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## COURSEWORK

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### **Math & Physics**

Calculus and Differential Equations, Vector Calculus and Linear Algebra, Probability and Statistics, Nonlinear Dynamics and Chaos, Biology, Kinematics, Electricity and Magnetism, Theoretical Physics, Solid State Physics, Quantum Mechanics, Thermodynamics, Heat and Mass Transfer and Fluid Dynamics.

### **Engineering & Design**

Mechanics of Solids and Structures, Material Science and Solid State Chemistry, Applied Dynamics, Modeling and Control, Software Design, Principles of Engineering Design, Mechanical Design, User Oriented Collaborative Design, Sustainable Design, Self Study - Project Management in Engineering.

### **Business**

Econometrics, Foundations of Business and Entrepreneurship, Accounting, Managerial Finance, Managing Operations and Costs, Technological Entrepreneurship, Technology Commercialization and Screening, Creative Destruction and Technology, Financing The Entrepreneurial Venture, Social Entrepreneurship, Marketing.

## SCHOLARSHIPS

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- Victoria Masters Fulbright Scholarship** Mar. '10  
 Recipient of a NZ\$25,000 scholarship for completion of a Masters thesis at Victoria University.
- Fulbright Scholarship** Feb. '08  
 Recipient of a highly prestigious and competitive Fulbright award valued at over NZ\$40,000.
- Goldman Sachs / Matsuo Takabuki Commemorative Scholarship** May '06  
 Recipient of a US\$20,000 scholarship for Hawaiians pursuing graduate degrees in business.
- Franklin W. Olin College of Engineering** May '03  
 Recipient of a four-year full tuition and room scholarship valued at US\$160,000.

## RESEARCH & EXPERIENCE

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**Callaghan Innovation**   
 Lower Hutt, NZ [www.callaghaninnovation.govt.nz](http://www.callaghaninnovation.govt.nz) | Mar. '13 - Present

*Visiting Researcher* - Making advanced surfaces using various micro-fabrication and chemical modification techniques. Work also includes building and designing equipment to test the surfaces. This work is part of a larger project that is studying ways to meet future water demands in New Zealand and throughout the world.

**Self-Employed**   
 Kaitaia, Northland, NZ [www.kmahelona.net](http://www.kmahelona.net) | Jan. '12 - Mar. '13

*Communications* - Designed, developed, and delivered communications strategic advice to Te Rūnanga Nui o Te Aupouri. Advised on executing an online strategy, creating unbiased and transparent communication pathways, and communicating complex and cross-generational information.

*IT & Business* - Provided information technology and business assistance to Te Reo Irirangi o Te Hiku o Te Ika, Northland's iwi radio station. Work included financial forecasting and budgeting, rebranding a radio station, market research, and putting radio stations online with Google Analytics data tracking.

*Professional Photographer* - Provided professional photographic services to the Office of Treaty Settlements. Client required a photographer who could work in a Māori environment.

**MacDiarmid Institute**   
 Kaitaia, New Zealand [www.macdiarmid.ac.nz/commercialisation-of-institute-research](http://www.macdiarmid.ac.nz/commercialisation-of-institute-research) | Sep. - Nov. '12

*Commercialization Research Project* - Investigated the technological and commercial feasibility of using technology developed within the MacDiarmid Institute for a particular application.

**Study of Graphene and Droplets using Molecular Dynamics**   
 Wellington, New Zealand [www.macdiarmid.ac.nz/researchers/hendy.php](http://www.macdiarmid.ac.nz/researchers/hendy.php) | Mar. '09 - Jul. '11

*M.Sc. Thesis advised by Prof. Shaun Hendy* - Used Molecular Dynamics (MD) to understand graphene, a sheet of graphite only a single-atom layer thick. One topic included understanding the formation of nano-bubbles, which could lead to novel nano-electronic devices. Also modeled liquid drops rolling down a super-hydrophobic surface, such as a lotus leaf, using MD and developed a theory for this type of system.

*Research was Self-Directed. Part of a research group of around eight students and two advisors.  
 Group met monthly to collaborate with and present to each other.*

**Electrical properties of Graphene**   
 Wellington, New Zealand [www.macdiarmid.ac.nz/researchers/kaiser.php](http://www.macdiarmid.ac.nz/researchers/kaiser.php) | Jul. - Nov. '09

*Honors Research Project with Prof. Alan Kaiser* - Characterized the frequencies of mesoscopic resistance fluctuations in graphene (graphene's resistivity fluctuates at low temperatures). Compared resistivity data for graphene and showed strong correlation of graphene phonons with resistivity (phonons are one cause for electrical resistance).

**Bluefin Robotics**

Cambridge, MA, U.S.

[www.bluefinrobotics.com](http://www.bluefinrobotics.com) | Jan. - Dec. '08

*Mechanical Engineer* - Worked and collaborated with a team of ten Mechanical Engineers. Designed mechanical systems for autonomous underwater vehicles (robots). Work included performing stress analyses for electronics housings, packaging electronics, and designing vehicle support systems. Often worked on 3 different projects at a time, usually consisting of a long-term and a short-term project. Job required collaboration with clients on designs, outsourcing designs for manufacturing, and finding new products to incorporate into design strategies.

*Presented design solutions to a Large Government Contractor.*

*Collaborated with other Engineering Departments.*

**Management Consulting Field Experience**

Babson Park, Massachusetts, U.S.

Jan. - May '08

*Consultant* - Developed a preliminary business plan with three other students for Osram-Sylvania with regard to launching a new product. Researched the product's industry and potential competitors. Developed a model that the company can apply to future ventures in order to judge the ventures' potential for success.

*Delivered a Report and Presentation analyzing the possible Success of a New Product.*

**Senior Consulting Program for Engineering**

Needham, Massachusetts, U.S.

[scope.olin.edu](http://scope.olin.edu) | Sep. '06 - May '07

*Project Coordinator* - Lead five students in converting a Ford Escape and Land Rover LR3 to "robot-ready" vehicles for Team MIT in the DARPA Urban Challenge. Used a Spiral Design Strategy to execute the project while collaborating with multiple external partners. Had to manage the integration of long-lead items with the continuous development of the vehicles so as to ensure on-time delivery of project goals. Other tasks included the integration of Consumer Off The Shelf parts and designing and building/outsourcing custom-made parts.

*Team Leader for a US\$100,000 contract between Olin and MIT. Collaborated with Software and Perception Teams so as to incorporate all necessary Mechanical Systems for these teams.*

**MIT and Charles Stark Draper Laboratory**

Cambridge, Massachusetts, U.S.

[www.draper.com](http://www.draper.com), [dgc.mit.edu](http://dgc.mit.edu) | May - Nov. '07

*System Testing and Integration Engineer* - Designed, built, and maintained power and mechanical systems for Team MIT's autonomous ground vehicle (a car that drives itself). Team placed 4th in the DARPA Urban Challenge ([archive.darpa.mil/grandchallenge/index.asp](http://archive.darpa.mil/grandchallenge/index.asp)), a race where cars navigated through an urban environment and performed tasks such as passing, parking, and avoiding oncoming vehicles. The team consisted of about 40 people, and the project was a collaboration between two universities and two research labs.

**SKILLS****Engineering**

*Proficient in:* SolidWorks 3D modeling and Finite Element Analysis; Designing and building systems comprising of Consumer Off The Shelf (COTS) materials; Building professional quality mock-up/prototypes using various fabrication techniques.

*Experienced in:* Working with sheet metal, lathes, mills, water jets, rapid prototyping, laser cutters, injection molding, plastics, and corrosive environments.

**Science**

*Proficient in:* Modeling mathematical and physical systems in MATLAB; Modeling systems using Molecular Dynamics; Self-directed research; Integrating public data into research via APIs.

**Software**

*Proficient in:* Python for scripting and automating tasks; JavaScript, HTML, and CSS for web design and development; Unix and Shell environments.

**Design**

*Experienced with:* User-Oriented Collaborative Design; Working in team-oriented environments; Consulting with collaborators, vendors, and industry.

**Communication**

*Experienced in:* Strategic Planning, Technical writing; Public Speaking; Delivering Presentations; Communicating science and technology to the general public; Project Management; Acting.

## PUBLICATIONS

*Nat J. Lund, Xingyou Philip Zhang, Keoni Mahelona, and Shaun C. Hendy.* Calculation of effective slip on rough chemically heterogeneous surfaces using a homogenization approach, Phys. Rev. E, vol. 86, pp. 046303-046309, Oct. 2012.

*Keoni K. Mahelona, Alan B. Kaiser, Viera Skàkalová,* Resistance and mesoscopic fluctuations in graphene, physica status solidi (b), Special Issue: Electronic Properties of Novel Materials (IWEPNM 2010), vol. 247, no. 11-12, pp. 2983–2987, Dec. 2010.

*John Leonard, et al.,* The DARPA Urban Challenge: Autonomous Vehicles in City Traffic (Springer Tracts in Advanced Robotics, vol. 56), Martin Buehler, Karl Iagnemma, Sanjiv Singh Eds. Berlin, Germany: Springer, 2009.

*John Leonard et al.,* A Perception-Driven Autonomous Urban Vehicle, Journal of Field Robotics, vol. 25, no. 10, pp. 727 - 774, Oct. 2008

## ACTIVITIES & COMMUNITY SERVICE

### Mahimaru Marae

Feb. '12 - Present

*Marae Member* - Helped the marae committee develop and execute a digital strategy. Obtained a \$4,000 grant from Pub Charity, which allowed the marae to purchase presentation equipment to support hui and learning initiatives. Obtained free Internet for the marae through sponsorship with Snap Internet in Christchurch. Set up wireless Internet in the marae with a customized captive portal. Hosted a science hui for the MacDiarmid Institute and partner universities. Working on launching a marae website and other digital initiatives.

### DSW Swim Club

Mar. '09 - Present

*Committee Member, Swimmer* - Maintain the club website and Facebook page. Design logos and communication materials (business cards, flyers, etc.). Competed in the Wellington AsiaPacific Outgames 2011. Helped club apply for and receive a NZ\$5,000 grant.

### Theatre Performance and Script Writing

Sep. '03 - Feb. '11

Filmed a short scene in the upcoming Bollywood film *Players*, and starred in *The Dispute* for the Hamilton Garden's Festival 2010. Original work includes *Beauty and Her Beast*, *The Lion's King*, and *My Little Mermaid*. Acted in *Brigadoon*, *The Laramie Project*, *Lost in Yonkers*, and *Arsenic and Old Lace*. Directed David Ive's *Mere Mortals* and *Philips Glass Buys a Loaf of Bread*.

## REFERENCES

Call me!

#### Dr. Geoff Willmott

*Senior Scientist* - Callaghan Innovation  
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#### Dr. Shaun Hendy

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*Principle Investigator* - MacDiarmid Institute  
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#### Mele Wendt

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 Phone: +64 04 494 1505

#### Knut Streitlien

*Mechanical Engineering Group Leader* - Bluefin Robotics  
 Email: [knutstreitlien@gmail.com](mailto:knutstreitlien@gmail.com)

Other references may be available upon request.  
**Please advise before contacting any references.**

Pictures, videos, and documents from my work may be found online @ [portfolio.kmahelona.net](http://portfolio.kmahelona.net).

Check this out! Only slightly outdated ;)