

# Erik J Luber

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## Current position

PhD Student, Materials Engineering, University of Alberta

## Areas of specialization

Solid-state dewetting, microfabrication, metallic glasses, neutron reflectometry, carbon nanotube growth, thin film synthesis and characterization, and atomic force microscopy.

## Summary of accomplishments at the university of alberta

- Published 15 journal manuscripts and 2 patent disclosures.
- Received several major national and provincial level research scholarships.

## Research techniques

During the course of my work I have become intimately familiar with the use of the following research tools/techniques:

- Sputtering, transmission electron microscopy (TEM), TEM sample prep, scanning electron microscopy, X-ray diffraction (XRD), AFM, Nanoindentation, differential scanning calorimetry (DSC), ellipsometry, multibeam optical stress sensing (MOSS), optical lithography, wet metal etching.
- MATLAB, C, MPI, Python, finite-difference time-domain (FDTD) simulation using Lumerical, Neutron reflectometry inversion using GenX.

## Honors & awards

2009	Alberta Ingenuity Nano Scholarship (36,000/y for 2 years)
2007	Alberta Ingenuity Student Scholarship (20,000/y for 2 years)
2007	Outstanding Teaching Assistant Award
2006	NSERC CGS M Scholarship (17,500/y for 2 years)
2006	Outstanding Teaching Assistant Award

## Education

2006

BSc in Engineering Physics, University of Alberta (GPA: 3.9/4.0)

## Patents & disclosures

E.J. Luber, B.C. Olsen, C. Ophus, V. Radmilovic, D. Mitlin, *Micro/Nano Devices Fabricated from Cu-Hf Thin Films*, US Provisional Patent Application, ser. no. 13/072,343: filed Mar. 25/11(2008062).

D. Mitlin, B. Zahiri, M. Danaie, X-H Tan, E. Luber and C. Harrower, *Kinetic Stabilization of Magnesium Hydride*, World Patent Application, ser. no. WO2011026214: filed Mar. 10/11.

C.T. Harrower, E. Luber, B. Shalchi-Amirkhiz, B. Zahiri, D. Mitlin, *Additives for Kinetic Stabilization of Magnesium Hydride*, US Provisional Patent Application, ser. no. 61/238,954: filed Sept. 01/09 (2009066).

## Journal publications (15)

2011

X. Liu, E.J. Luber, D. Mitlin and H. Zhang *Design of High  $T_g$  Zr-based Metallic Glass using Atomistic Simulations and Experiments* Philosophical Magazine, First published on: 13 June 2011. [10.1080/14786435.2011.580288](https://doi.org/10.1080/14786435.2011.580288)

P. Kalisvaart, E.J. Luber, H. Fritzsche and D. Mitlin *Effect of alloying magnesium with chromium and vanadium on hydrogenation kinetics studied with neutron reflectometry* Chemical Communications **47**, 4294. [10.1039/c0cc05501h](https://doi.org/10.1039/c0cc05501h)

H. Fritzsche, E. Poirier, J. Haagsma, C. Ophus, E.J. Luber, C.T. Harrower and D. Mitlin *A systematic neutron reflectometry study on hydrogen absorption in thin  $Mg_{1-x}Al_x$  alloy films* Canadian Journal of Physics **88**, 723. [10.1139/P09-085](https://doi.org/10.1139/P09-085)

2010

E.J. Luber, B.C. Olsen, C. Ophus and D. Mitlin, *Solid-state dewetting mechanisms of ultrathin Ni films revealed by combining in situ time resolved differential reflectometry and atomic force microscopy* Physical Review B **82**, 085497. [10.1103/PhysRevB.82.085407](https://doi.org/10.1103/PhysRevB.82.085407)

C. Ophus, E.J. Luber and D. Mitlin, *The role of self-shadowing on growth and scaling laws of faceted polycrystalline thin films* Acta Materialia **58**, 5150. [10.1016/j.actamat.2010.05.051](https://doi.org/10.1016/j.actamat.2010.05.051)

C. Ophus, E.J. Luber and D. Mitlin, *Analytic description of competitive grain growth*. Physical Review E **81**, 011601. [10.1103/PhysRevE.81.011601](https://doi.org/10.1103/PhysRevE.81.011601)

- W.P. Kalisvaart, C.T. Harrower, J. Haagsma, B. Zahiri, E. J. Lubert, C. Ophus, E. Poirier, H. Fritzsche and D. Mitlin, *Hydrogen storage in binary and ternary Mg-based alloys: A comprehensive experimental study*. International Journal of Hydrogen Energy **35**, 2091. [10.1016/j.ijhydene.2009.12.013](https://doi.org/10.1016/j.ijhydene.2009.12.013)
- 2009 E.J. Lubert, B.C. Olsen, C. Ophus, V. Radmilovic and D. Mitlin, *All-metal AFM probes fabricated from microstructurally tailored Cu-Hf thin films* Nanotechnology **20**, 345703. [10.1088/0957-4484/20/34/345703](https://doi.org/10.1088/0957-4484/20/34/345703)
- C. Ophus, E.J. Lubert, M. Edelen, Z. Lee, L.M. Fischer, S. Evoy, D. Lewis, U. Dahmen, V. Radmilovic and D. Mitlin, *Nanocrystalline-amorphous transitions in Al-Mo thin films: bulk and surface evolution*. Acta Materialia **57**, 4296. [10.1016/j.actamat.2009.05.029](https://doi.org/10.1016/j.actamat.2009.05.029)
- H. Fritzsche, C. Ophus, C.T. Harrower, E.J. Lubert and D. Mitlin, *Low temperature hydrogen desorption in MgAl thin films achieved by using a nanoscale Td/Pd bilayer catalyst*. Appl Phys Lett **94**, 24190. <http://dx.doi.org/10.1063/1.3154550>
- C. Ophus, E.J. Lubert and D. Mitlin, *Simulations of faceted polycrystalline thin films: asymptotic analysis* Acta Materialia **57**, 1327. <http://dx.doi.org/10.1016/j.actamat.2008.11.014>
- 2008 H. Fritzsche, M. Saoudi, J. Haagsma, C. Ophus, E. Lubert, C.T. Harrower and D. Mitlin, *Neutron reflectometry study of hydrogen desorption in destabilized MgAl alloy thin films* Applied Physics Letters **92**, 121917. [10.1063/1.2899936](https://doi.org/10.1063/1.2899936)
- C. Ophus, N. Nelson-Fitzpatrick, Z. Lee, E. Lubert, C. Harrower, K. Westra, U. Dahmen, V. Radmilovic, S. Evoy and D. Mitlin, *Resonance properties and microstructure of ultracompliant metallic nanoelectromechanical systems resonators synthesized from Al-32at%Mo amorphous-nanocrystalline metallic composites* Applied Physics Letters **92**, 123108. [10.1063/1.2841849](https://doi.org/10.1063/1.2841849)
- E. Lubert, R. Mohammadi, C. Ophus, Z. Lee, N. Nelson-Fitzpatrick, K. Westra, S. Evoy, U. Dahmen, V. Radmilovic and D. Mitlin, *Tailoring the microstructure and surface morphology of metal thin films for nano-electro-mechanical systems applications* Nanotechnology **19**, 125705. [10.1088/0957-4484/19/12/125705](https://doi.org/10.1088/0957-4484/19/12/125705)
- 2007 N. Nelson-Fitzpatrick, C. Ophus, E. Lubert, L. Gervais, Z. Lee, V. Radmilovic, D. Mitlin and S. Evoy, *Synthesis and Characterization of Au-Ta Nanocomposites for NEMS Cantilever Devices* Nanotechnology **18**, 355303. [10.1088/0957-4484/18/35/355303](https://doi.org/10.1088/0957-4484/18/35/355303)

## References

References available upon request