ZEV LOVINGER

CURRICULUM VITAE

(updated October 2023)

PERSONAL

Name:	Zev Lovinger
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Date & place of birth:	September 21, 1972. Montreal, Canada
Immigration:	September 1978
Family status:	married + 3
Citizenships:	Israeli

ACADEMIC DEGREES

2008-2014	Ph.D., Mechanical Engineering. The Technion – Israel Institute of Technology. Faculty of Mechanical Engineering
1999-2001	M.Sc., Civil (structure) Engineering (Suma Cum Laude). The Technion – Israel Institute of Technology. Faculty of Civil Engineering
1996-1999	B.Sc., Civil (structure) Engineering (Suma Cum Laude). The Technion – Israel Institute of Technology. Faculty of Civil Engineering

ACADEMIC APPOINTMENTS

2022-current	Research associate Technion -Israel Institute of Technology Dept. of Mechanical Engineering
2017-2019	Visiting associate (Postdoctoral Associate) Caltech – California Institute of Technology Dept. of Mechanical and civil Engineering (MCE) California, USA

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PROFESSIONAL EXPERIENCE

2021-present	RAFAEL, R&D Project manager for future developments at the armament division.
2019-2020	RAFAEL, senior researcher, Armament division.
(2017-2019)	(CALTECH – visiting/postdoc associate)
2014-2017	RAFAEL – Head of R&D group of materials and structures at the armament division.
2008-2013	RAFAEL – senior researcher, Armament division.
2001-2007	RAFAEL – researcher, Armament division.

RESEARCH INTERESTS

Dynamic Behavior of Materials at extreme conditions. Material strength and failure at high strain rates, high pressures and shock loading: Numerical (FEM) modelling of material/structural behavior and Experimental techniques to measure material properties under extreme conditions.

AWARDS & DISTINCTIONS

2021	**SEM Peterson award** (Best research paper published in the Journal of Dynamic Behavior of Materials in the year 2020).
2016	**Candidate for Rafael prize for Excellence in research**
2014	**PhD Excellence Award** by the Amnon Pazy Fund
2002-2008	**Katzir** Fellowship
2002	**Gutwirth** foundation **special excellence award**
2002	**Wolf Foundation MSc excellence award**

GRADUATE STUDENTS

M.Sc. in progress

1. **Aharon Zaritzky**, (2020), "Investigating failure characteristics of metals in high strain rates using magnetically accelerated cylinders" (co-advisor with Prof. D. Rittel).

M.Sc. completed

1. **S. Cibola,** (2014), "Dynamic tension of brittle polymers" (co-advisor with Prof. D. Rittel)

2. **E. Avriel,** (2013), "Ultra high strain rates by electromagnetic loading". (co-advisor with Prof. D. Rittel)

RESEARCH ACTIVITIES

2019-current	RAFAEL academic research funds - (1) Strength and failure of metals at very high strain rates using expanding and collapsing cylinder driven by magnetic forces. (2) Failure modes of pore collapse under shock loading.
2017-2021	CALTECH (formally as a visiting associate) – California Institute of Technology (with Prof. Guruswami Ravichandran). (1) Development of experimental techniques and analyses of PSPI - pressure shear plate impact experiments, (2) Shock properties of porous metals.
2015-2019	RAFAEL/TECHNION - **H2020-MSCA-ITN-2015-ETN** on the topic of "The outstanding challenge in solid mechanics: engineering structures subjected to extreme loading conditions" - Rafael Scientist in charge, on supervisory board.
2013-2016	**Pazy** research foundation (with Prof. Rittel, Technion). Investigating strength and failure characteristics of materials at very high strain rates using magnetically driven expanding cylinders.

PUBLICATIONS

Theses

Ph.D. thesis	*Multiple adiabatic shear bands in a collapsing cylinder – failure characterization and microstructural effects*. Advisor: Prof. D. Rittel.
M.Sc. thesis	*A two dimensional (2D) stress analysis of bonded tile-wall systems and failure criteria*. Advisor: Prof. Y. Frostig.

Published papers

Journals

1. **Z. Lovinger**, Y. Frostig, "High Order Behavior of Sandwich Plates with Free Edges – Edge effects" (2004), *Int. Journal of Solids and Structures, Vol. 41, pp. 979-1004.*
2. **Z. Lovinger**, A. Rikanati, Z. Rosenberg, D. Rittel, (2011) "Electro-Magnetic Collapse of Thick Walled Cylinders to investigate spontaneous shear localization", *Int. Journal of Impact Engineering, Vol. 38, 918-929.*
3. **Z. Lovinger**, D. Rittel, Z. Rosenberg (2015) "An experimental study on spontaneous Adiabatic Shear Band formation in Electro-Magnetically Collapsing Cylinders", *JMPS*, Vol. 79, pp.134-156.
4. **Z. Lovinger**, D. Rittel, Z. Rosenberg, (2018) "Modeling spontaneous adiabatic shear band formation in Electro-Magnetically Collapsing Thick Walled Cylinders, *Mech. Mat. 116, pp. 130-145*
5. E. Avriel, **Z. Lovinger,** R. Nemirovsky, D. Rittel, (2018) " Investigating the strength of materials at very high strain rates using electromagnetically driven expanding cylinders ", *Mechmat. 117, pp.165-180*

6. S. Zibula, **Z. Lovinger,** D. Rittel, (2018) " Dynamic tension of ductile polymers: Experimentation and modelling ", *Mechmat. 123, pp. 30-42*
7. C. Kettenbeil, **Z. Lovinger**, S. Ravindran, M. Mello, G. Ravichandran, (2020) "Pressure Shear Plate Impact Experiments at High Pressures", *Journal of Dynamic Behavior of Materials, Vol. 6, pp. 489-501.*
8. S. Ravindran, **Z. Lovinger,** V. Gandhi, M. Mello, G. Ravichandran, (2020) "Strength of magnesium at high pressures and strain rates", *Extreme mechanics letters, Vol. 41, 101044.*
9. S. Ravindran, V. Gandhi, **Z. Lovinger**, M. Mello, G. Ravichandran, (2021) "Dynamic strength of copper at high pressures using pressure shear plate experiments", *Journal of Dynamic Behavior of Materials, Vol. 7, pp. 248-261.*
10. **Z. Lovinger**, C. Czarnota, S. Ravindran, A. Molinari, G. Ravichandran, (2021), "The role of micro-inertia on the shock structure in Porous metal", *JMPS, Vol. 154, 104508.*
11. C. Kettenbeil, **Z. Lovinger**, M. Mello, G. Ravichandran, T. Jiao, R. Clifton (2022) "Inelastic Behavior of Tungsten Carbide at High Pressures", *JMPS, Vol. 159, 104762.*
12. **Z. Lovinger**, R. Kositski, "Shear Localization as a damage mechanism in pore collapse under shock compression", Mechanics of materials, *submitted* (2023).

Conference Proceedings

13. **Z. Lovinger**, Y. Frostig, (2003) "Edge Effects in the Behavior of Sandwich Plates with Free Edges And A "soft" Core – A High Order Approach", *6th confrence of sandwich structures", Florida, USA.*
14. A. Lindenfeld, **Z. Lovinger**, Y. Kivity, "Response of a Steel Pipe to Internal Explosion in Air and in Aqueous Foams" (2003), *11th International Symposium of Explosives and Munitions, Manheim, Germany*
15. **Z. Lovinger**, A. Rikanati, D. Rittel, Z. Rosenberg, (2009) "Investigation of Adiabatic shear band formation in Thick Walled Cylinders Collapsed By Electro-Magnetic Forces", *16th APS-SCCM conference, Nashville, USA*
16. **Z. Lovinger**, Y. Partom, "Simulation of Multiple Shear Bands in Collapsing Cylinder Experiments", (2009), DYMAT2009 *Proceedings*, Brussels, Belgium.
17. **Z. Lovinger**, Y. Ashuach, O. Firstenberg, (2009), "Measuring Dynamic Strength at low Plastic Strains Using a Hat-Shaped Specimen", DYMAT2009 *Proceedings*, Brussels, Belgium.
18. Y. Partom, **Z. Lovinger** "Simulating Rate Dependent Spalling with an Overstress Model", (2012), DYMAT2012 *Proceedings*, Freiburg, Germany.
19. **Z. Lovinger**, Z. Rosenberg, D. Rittel, (2014) "On the Spacing of Spontaneous Adiabatic shear bands in Collapsing Thick Walled Cylinders ", ICEM16, Cambridge, UK, 2014.
20. **Z. Lovinger**, R. Nemirovsky, E. Avriel, A. Dorogoy, Y. Ashuach, D. Rittel, (2015), "Investigating strength of materials at very high strain rates using magnetically driven expanding cylinders", *DYMAT2015 Proceedings, Lugano, Switzerland.*
21. **Z. Lovinger**, D. Rittel, Z. Rosenberg, (2015) "On what controls the spacing of spontaneous adiabatic shear bands in collapsing thick walled cylinders", *DYMAT2015 Proceedings, Lugano, Switzerland.*
22. M. Mello, C. Kettenbeil, M. Bischann, **Z. Lovinger**, G. Ravichandran, (2018) "Heterodyne Diffracted Beam Photonic Doppler Velocimeter (DPDV) for Pressure-Shear Shock Experiments", Dynamic behavior of materials, Vol1, pp. 73-76
23. **Z. Lovinger**, C. Kettenbeil, M. Mello, G. Ravichandran, (2018) "Inelastic Behavior of Tungsten-Carbide in Pressure-Shear Impact Shock Experiments Beyond 20 GPa", SEM proceedings, Dynamic behavior of materials, Vol1, pp. 65-67.

24. S. Chocron, A. Carpenter, N. Scott, O. Spector, A. Malka-Markovitz, **Z. Lovinger**, D. Havatzelet, (2018) "Ballistic and Material Tests and Simulations on Ultra-High Performance Concrete", SEM proceedings, Dynamic behavior of materials, Vol1, pp. 189-194.
25. **Z. Lovinger**, C. Czarnota, S. Ravindran, C. Kettenbeil, A. Molinari, G. Ravichandran, (2020), "Shock Structure and Spall Behavior of Porous Aluminum", *21st APS-SCCM conference proceedings, Portland,* USA. AIP Conference Proceedings 2272, 120015 https://doi.org/10.1063/12.0000913
26. C. Kettenbeil, **Z. Lovinger**, S. Ravindran, M. Mello, G. Ravichandran, (2020), "Pressure Shear Plate Impact Experiments at Very High Pressures", *21st APS-SCCM conference proceedings, Portland,* USA. AIP Conference Proceedings 2272, 120010 https://doi.org/10.1063/12.0001099
27. S. Ravindran, **Z. Lovinger**, C. Kettenbeil, M. Mello, G. Ravichandran, (2020), "Pressure Shear Plate Impact Experiments of Magnesium at High Pressures", *21st APS-SCCM conference proceedings, Portland, USA.* AIP Conference Proceedings 2272, 120022 https://doi.org/10.1063/12.0001022
28. **Z. Lovinger**, K. Cohen, O. Regev, S. Osovski, D. Rittel, (2023), "3D Characterization of Failure Modes in Magnetically Driven Collapsing Cylinders", *23rd APS-SCCM conference proceedings, Chicago, USA.* AIP Conference Proceedings, (*submitted*).

CONFERENCES

Contributed talks

1. 23rd APS-SCCM Meeting on Shock Compression of Condensed Matter, Chicago, IL USA, June 2023
2. 22nd APS-SCCM Meeting on Shock Compression of Condensed Matter, Anaheim, CA USA, June 2022
3. MACH conference – on multiscale research of materials, Annapolis, USA, April 2022.
4. 21st APS-SCCM Meeting on Shock Compression of Condensed Matter, Portland, OR USA, June 2019.
5. MACH conference – on multiscale research of materials, Annapolis, USA, April 2019.
6. SEM conference – Society of Experimental mechanics, Greenville, SC, USA, June 2018.
7. IUTAM, symposium on dynamic instabilities, Madrid, Spain, May 2016.
8. 34th ICME, Technion, Haifa, Israel (with E. Avriel), Nov. 2016.
9. The Israeli conference on materials and mechanical systems (under extreme conditions), Nov. 2015.
10. 11th International Dymat Conference, Lugano, Switzerland, Sept. 2015.
11. 16th International conference on experimental mechanics (ISEM), Cambridge, UK, July 2014.
12. 18th APS-SCCM Meeting on Shock Compression of Condensed Matter, Seattle, WA USA, July 2013.
13. 10th International Dymat Conference, Freiburg, Germany, Sept. 2012.
14. 17th APS-SCCM Meeting on Shock Compression of Condensed Matter, Chicago, IL, USA, June 2011.
15. 1st TMS-ABM Materials congress, July 2010.

16. 16th APS-SCCM Meeting on Shock Compression of Condensed Matter, Nashville USA, June 2009.
17. 9th International Dymat Conference, Bruxelles, Sept. 2009.
18. 11th International Symposium of Explosives and Munitions, Manheim, Germany, 2003.
19. 6th conference of sandwich structures, Florida, USA, 2003.