

Curriculum vitae: Dr. Assaf Shimony

Assaf Shimony
Physics Department,
Nuclear Research Center Negev (NRCN)
P.O.Box 9001 Beer-Sheva, 84190, Israel
Phone: +972-50-6244878
E-mail: shimonya@gmail.com

Education:

2006-2017: Combined M.sc (2011) and Ph.D (2017) in physics, Ben Gurion University of the Negev, Israel. Supervisors: Prof. Dov Shvarts, Prof. Dan Rich and Prof. Reuben Shuker. Thesis title: "The Development of Kelvin-Helmholtz Instability in High Mach Numbers".

2002-2005: B.sc in physics, Magna cum laude, Ben Gurion University of the Negev, Israel.

Employment:

2009-: Researcher in the physics department, NRCN.

2005-2009: Military service: officer in general corps, IDF.

Professional Experience:

Principal Investigator for hydrodynamic instabilities experiments at the National Ignition facility- 3 shot days in 2020-2021.

Journal Referee: *Nature*, *Physics of Plasmas*

Awards:

2002: Honorable mentioned, "First Step to the Nobel Prize in Physics".

2002-2004: The Suzanne Zlotowski Scholarship for outstanding students. Ben Gurion University.

2016: Excellent research prize, NRCN.

2019: Excellent employee, NRCN.

Assaf Shimony - Refereed publications:

1. G. Malamud, L. Elgin, T. Handy, C. Huntington, R. P. Drake, D. Shvarts, A. Shimony, and C. C. Kuranz. "Design of a single-mode Rayleigh–Taylor instability experiment in the highly nonlinear regime." *High Energy Density Physics* 32 (2019): 18-30.2. A.
2. Shimony, W. C. Wan, S. R. Klein, C. C. Kuranz, R. P. Drake, D. Shvarts, G. Malamud, "Construction and validation of a statistical model for the nonlinear Kelvin-Helmholtz instability under compressible, multimode conditions", *Physics of plasmas* 25.12 (2018): 122112.
3. C. M. Huntington, A. Shimony, M. Trantham, C. C. Kuranz, D. Shvarts, C. A. Di Stefano, F. W. Doss, R. P. Drake, K. A. Flippo, D. H. Kalantar, S. R. Klein, J. L. Kline, S. A. MacLaren, G. Malamud, A. R. Miles, S. T. Prisbrey, K. S. Raman, B. A. Remington et al., "Ablative stabilization of Rayleigh-Taylor instabilities resulting from a laser-driven radiative shock", *Physics of Plasmas* 25.5 (2018): 052118.
4. C. C. Kuranz, H.-S. Park, C. M. Huntington, A. R. Miles, B. A. Remington, T. Plewa, M. R. Trantham, H. F. Robey, D. Shvarts, A. Shimony, K. Raman, S. MacLaren, W. C. Wan, F. W. Doss, J. Kline, K. A. Flippo, G. Malamud, T. A. Handy et al., "How high energy fluxes may affect Rayleigh–Taylor instability growth in young supernova remnants", *Nature Communications* 19.1 (2018), 1564.
5. A. Shimony, G. Malamud and D. Shvarts, "Density Ratio and Entrainment Effects on Asymptotic Rayleigh–Taylor Instability", *Journal of Fluid Engineering* 140.5 (2018), 050906.
6. W. C. Wan, G. Malamud, A. Shimony, C. A. Di Stefano, M. R. Trantham, S. R. Klein, D. Shvarts, R. P. Drake and C. C. Kuranz. "Observation of dual-mode, Kelvin-Helmholtz instability vortex merger in a compressible flow", *Physics of Plasmas* 24.5 (2017), 055705.
7. W. C. Wan, G. Malamud, A. Shimony, C. A. Di Stefano, M. R. Trantham, S. R. Klein, J. D. Soltis, D. Shvarts, R. P. Drake and C. C. Kuranz. "Impact of ablator thickness and laser drive duration on a platform for supersonic, shockwave-driven hydrodynamic instability experiments", *High Energy Density Physics* 22 (2017), 6-11.
8. A. Shimony, G. Malamud, C.A. Di Stefano, C.C. Kuranz, R.P. Drake, D. Shvarts, "The effect of a dominant initial single mode on the Kelvin-Helmholtz instability evolution: new insights on previous experimental results", *Journal of Fluid Engineering* 138.7 (2016), 070902.
9. W. C. Wan, G. Malamud, A. Shimony, C. A. Di Stefano, M. R. Trantham, S. R. Klein, D. Shvarts, C. C. Kuranz, R. P. Drake, "Observation of Single-Mode, Kelvin-Helmholtz Instability in a Supersonic Flow", *Physical Review Letters* 115, 145001 (2015).
10. C. A. Di Stefano, G. Malamud, M. T. Henry de Frahan, C. C. Kuranz, A. Shimony, S. R. Klein, R. P. Drake, E. Johnsen, D. Shvarts, V. A. Smalyuk and D. Martinez,

"Observation and modeling of mixing-layer development in high-energy-density, blast-wave-driven shear flow", *Physics of Plasmas* 21 (2014), 056306.

11. G. Malamud, A. Shimony, W.C. Wan, C.A. Di Stefano, Y. Elbaz, C.C. Kuranz, P.A. Keiter, R.P. Drake, D. Shvarts, "A design of a two-dimensional, supersonic KH experiment on OMEGA-EP." *High Energy Density Physics* 9.4 (2013): 672-686.

12. V.A. Smalyuk, O.A. Hurricane, J.F. Hansen, G. Langstaff, D. Martinez, H.-S. Park, K. Raman, B.A. Remington, H.F. Robey, O. Schilling, R. Wallace, Y. Elbaz, A. Shimony, D. Shvarts, C. Di Stefano, R.P. Drake, D. Marion, C.M. Krauland, C.C. Kuranz, "Measurements of turbulent mixing due to Kelvin–Helmholtz instability in high-energy-density plasmas." *High Energy Density Physics* 9.1 (2013): 47-51.

12. V. A. Smalyuk, J. F. Hansen, O. A. Hurricane, G. Langstaff, D. Martinez, H.-S. Park, K. Raman, B. A. Remington, H. F. Robey, O. Schilling, R. Wallace, Y. Elbaz, A. Shimony, D. Shvarts, C. Di Stefano, R. P. Drake, D. Marion, C. M. Krauland and C. C. Kuranz, "Experimental observations of turbulent mixing due to Kelvin–Helmholtz instability on the OMEGA Laser Facility." *Physics of Plasmas* 19.9 (2012): 092702.

Conference presentations:

1. "Exploring the Self-Similar Stage of the Rayleigh-Taylor Instability via LLNL's NIF Discovery Science Experiments", CHILI2019, Tel Aviv, Israel, 2019.

2. "0.03 or 0.06? - Resolving the Question of the Value of α -Rayleigh-Taylor for Miscible Fluids and Short Wavelength Band of Initial Perturbation (Part II)". NIF and JLF Group Meeting 2019, Livermore, California, 2019.

3. "Exploring the late time asymptotic evolution of Rayleigh-Taylor instability via NIF discovery science experiments", 60th Annual Meeting of the APS Division of Plasma Physics, Portland, Oregon, USA, 2018.

4. "Modeling and simulations of radiative blast wave driven Rayleigh-Taylor instability experiments", 59th Annual Meeting of the APS Division of Plasma Physics, Milwaukee, Wisconsin, USA, 2017.

5. "Density ratio and entrainment effects on asymptotic Rayleigh-Taylor instability in two and three dimensions", 15th International Workshop on the Physics of Compressible Turbulent Mixing, Sydney, Australia, 2016.

6. "Towards a statistical model for KH instability in the compressible regime: numerical calculations and experiments", 14th International Workshop on the Physics of Compressible Turbulent Mixing, San Francisco, California, USA, 2014.