

Tsviki Y. Hirsh

Experimental Nuclear Physicist

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Education

- 2014–2016 **Post-doc studies in precision nuclear measurements**, Argonne National Lab., Chicago, USA.
- 2007–2012 **Ph.D. in experimental nuclear physics**, Weizmann Institute of Science, Israel.
"Production of ^8Li and ^6He radioactive beams in high current deuteron accelerators"
- 2003–2004 **M.Sc. in complex system physics**, Bar Ilan university, Israel, *magna cum laude*.
"Propagation of cracks in amorphous media"
- 2000–2003 **B.Sc.**, Bar Ilan university, Ramat Gan, Israel, *magna cum laude*.
Physics

Experience

- 2004–present **Researcher at the SARAF accelerator**, Soreq Nuclear Research Center, Yavne, Israel.
During the last 9 years I have studied and worked in different projects at the SARAF (Soreq Applied Research Accelerator Facility) department at Soreq Nuclear Research Center.
I have gained experience in:
- Development of high power irradiation targets for the production of fast neutrons and radioactive beams
 - Design and performing high precision nuclear measurements using traps
 - Data analysis of experimental results using modern big-data tools
 - High-level radiation transport Monte-Carlo simulations
 - Gamma and neutron spectroscopy, using different scintillation and solid-state detectors
 - Establishing scientific collaborations with the Israeli and international community
- 2003–2004 **Teaching assistant**, Bar Ilan University, Ramat Gan, Israel.
Responsible for teaching assistance of the following courses:
Quantum Mechanics for 3rd year physics students (parts 1 and 2)
Physics for Chemists (parts 1 and 2)

Honors and Prizes

- 2012-2018 **Katzir 6-year scholarship for promising Israeli scientists.**
- 2012 **Pazi prize for an excellent student in Israel Council for higher education researches..**
- 2010 **First Prize for the best poster**, EURORIB10 conf., Lamura, France.
- 2004 **Master degree excellence scholarship**, Physics dept., Bar-Ilan Univ..
- 2003 **Department award for an excellent student**, Physics dept., Bar-Ilan Univ..

Languages

English Fluent reading, writing and speaking
Hebrew Native language

Computer skills

Monte-Carlo MCNP, FLUKA, EGS
Programming Python, C++ , MATLAB
Miscellaneous Latex, DAQ systems, LABVIEW,
Hardware interfaces

Publications

Peer-review Publications

- R. Orford, et al., T.Y. Hirsh, “Precision Mass Measurements of Neutron-Rich Neodymium and Samarium Isotopes and Their Role in Understanding Rare-Earth Peak Formation”, Phys. Rev. Lett., 120, 26, 262702 (2018).
- T.Y. Hirsh et al., “The use of cosmic-ray muons in the energy calibration of the Beta-decay Paul Trap silicon-detector array”, Nucl. Inst. Meth. 887, 122-127 (2018).
- Israel Mardor, et al., T.Y. Hirsh, “The Soreq Applied Research Accelerator Facility (SARAF): Overview, research programs and future plans”, Euro. Phys. J. A 54:91 (2018).
- T.Y. Hirsh, Nancy Paul, Mary Burkey, Ani Aprahamian, Fritz Buchinger, Shane Caldwell, Jason A. Clark, Anthony F. Levand, Lin Ling Ying, Scott T. Marley, Graeme E. Morgan, Andrew Nystrom, Rodney Orford, Adrian Pérez Galván, John Rohrer, Guy Savard, Kumar S. Sharma, Kevin Siegl, “First operation and mass separation with the CARIBU MR-TOF”, Nuclear Instruments and Methods B, 376, 229-232 (2016).
- T.R. Edgecock et al., T.Y. Hirsh, “High intensity neutrino oscillation facilities in Europe”, Phys. Rev. special topics, 16, 021002 (2013).
- A. Dhal, S. Vaintraub, T. Trivedi, O. Aviv, T.Y. Hirsh, M.L. Rappaport, D. Melnik, O. Heber, D. Schwalm, D. Zajfman, K. Blaum, M. Hass “Probing fundamental interactions by an electrostatic ion beam trap”, Acta Phys. Polonica B, 44, no.3, 647-650 (2013).
- E. Wildner, et al., T.Y. Hirsh, “Beta beams”, Phys. Rev. special topics (in Revision), (2013).
- T. Stora, E. Noah, R. Hodak, T.Y. Hirsh, M. Hass et al., “A high intensity He-6 beam for the beta-beam neutrino oscillation facility”, Euro Phys. Lett., 98, 32001 (2012).
- T.Y. Hirsh, D. Berkovits, M. Hass, P. Jardin, A. Pichard, M.L. Rappaport, Y. Shachar, I. Silverman, O. Aviv, “Toward an intense radioactive ^8Li beam at SARAF Phase-I”, J. of Physics, 337, 012010 (2012).
- O. Aviv, S. Vaintraub, T.Y. Hirsh, A. Dhal, M.L. Rappaport, D. Melnik, O. Heber, D. Schwalm, D. Zajfman, K. Blaum, M. Hass, “Beta decay measurements from ^6He using an electrostatic ion beam trap”, J. of Physics, 337, 012020 (2012).
- G. Feinberg, M. Friedman, A. Krása, A. Shor, Y. Eisen, D. Berkovits, G. Giorginis, T.Y. Hirsh, M. Paul, A.J.M. Plompen, “Quasi-stellar neutrons from the $^7\text{Li}(p,n)^7\text{Be}$ reaction with an energy-broadened proton beam”, Phys. Rev. C, 85, 055810 (2012).

- G. Feinberg, A. Shor, D. Berkovits, Y. Eisen, M. Friedman, G. Giorginis, T.Y. Hirsh, A. Krasa, M. Paul, A. Plompen, E. Tsuk, “*Energy-broadened proton beam for production of quasi-stellar neutrons from the ${}^7\text{Li}(p,n){}^7\text{Be}$ reaction*”, J. of Physics 337, 012044 (2012).
- M. Hass, D. Berkovits, T.Y. Hirsh, M. Lewitowicz and F. de-Oliveira, “*Light radioisotopes for nuclear astrophysics and neutrino physics*”, J. of Physics G 35, 014042 (2008).

Publication in Proceedings

- Ben Ohayon et al., T.Y. Hirsh, “*Weak interaction studies at SARAF*”, Hyperfine Interactions. 239:57 (2018).
- R. Orford. T.Y. Hirsh et al., “*Phase-imaging Mass Measurements with the Canadian Penning Trap Mass Spectrometer*”, JPS Conf. Proc. 14, 011102 (2017).
- I. Mardor, et al., T.Y. Hirsh, “*Research Programs and Plans at the Soreq Applied Research Accelerator Facility - SARAF*”, PoS(INPC2016)109 (2017).
- R. Orford. T.Y. Hirsh et al., “*Beta-Delayed Neutron Studies Using Trapped Ions from CARIBU*”, Proceedings of ICFN6. 435 (2017).
- E. Wildner, et al., T.Y. Hirsh, “*Beta beams for precision measurements of neutrino oscillation parameters*”, Proc. of IPAC12, THPPP087 (2012).
- L. Weissman et al., T.Y. Hirsh, “*Beam operations of SARAF at 2011*”, Proc. of INS26 (2012).
- Y. Eisen, et al., T.Y. Hirsh, “*Towards the production of semi-Maxwellian neutron spectrum using SARAF*”, Proc. of INS26, 1-4 (2012).
- D. Berkovits, et al., T.Y. Hirsh, “*Operational experience and future goals of the SARAF proton / deuteron LINAC*”, Proc. of LINAC2012, MO1A01 (2012).
- L. Weissman et al., T.Y. Hirsh, “*The status of the SARAF phase-I LINAC*”, Proc. of RUPAC2012, WEBCH01 (2012).
- A. Shor, G. Feinberg, Y. Eisen, M. Friedman, A. Krasa, D. Berkovits, T.Y. Hirsh, G. Giorginis, M. Paul, A. Plompen, “*Effects of an energy broadened proton beam on the neutron distribution of the ${}^7\text{Li}(p,n){}^7\text{Be}$ reaction*”, NEMEA proc., Krakow, 25-28 (2010).
- T.Y. Hirsh, M. Hass, S. Vaintraub, V. Kumar, T. Stora, R. Hodak, E. Noah, “*Unfolding of ISOLDE neutron spectrum*”, Proc. of 25th NPS, Dead sea, 411-415 (2010).
- Y. Nir-El, T.Y. Hirsh, L. Weissman and M. Stern, “*Measurement of neutron fluxes at proximity to a (d,t) neutron generator*”, Proc. of 25th NPS, Dead sea, 324-328 (2010).
- M.G. Saint-Laurent, A. Pichard, G. Lhersonneau, F. de Oliveira, F. Pellemoine, P. Delahaye, M. Fadil, H. Franberg, R. Leroy, M. Hass, T.Y. Hirsh, L. Serani, P. Alfaut, C.E. Demonchy, et al., “*Comparison of expected yields for light radioactive beams at SPIRAL-1 and 2*”, APS conf. Proc. EXSON2009, 1224, 482-491 (2009) .
- T.Y. Hirsh, M. Hass, D. Berkovits, et al., “*High yield production of He-6 and Li-8 RIB for astrophysics and neutrino physics*”, PoS NUFAC08, 090 (2008).
- M. Hass, D. Berkovits, T.Y. Hirsh, V. Kumar, M. Lewitowicz, F. de-Oliveira and S. Vaintraub, “*Light radio-isotopes for nuclear astrophysics and neutrino physics*”, Proceedings of the INPC07 Conference, Tokyo, 2007. Nucl. Phys. A805, 639 (2008).

- T.Y. Hirsh, D. Berkovits, and M. Hass, “*Light RIB production with a 40 MeV deuteron beam*”, Proc. of the 24th NPS, Dead sea p40-44 (2008).

Reports

- G. Lhersonneau, F. de-Oliveira, T.Y. Hirsh, et al., SPIRAL2pp WP7.1 report, 1-41 (2009).
- T.Y. Hirsh, D. Berkovits, M. Hass, “*⁶He preliminary production optimization*”, Soreq report, 3895 (2007)
- T.Y. Hirsh, D.A Kessler, “*Crack (non) propagation in amorphous media*”, arXiv cond-mat/0409607 (2004).

Posters

- T. Kuta et al., T.Y. Hirsh, “*Measurements of Masses with the Canadian Penning Trap*”, Poster, APS Division Nuclear Physics Meeting 2016, Vancouver, Canada (2016).
- T. Kuta et al., T.Y. Hirsh, “*Canadian Penning Trap Mass Measurements using a Position Sensitive MCP*”, Poster, APS Division Nuclear Physics Meeting 2015, Santa Fe, USA (2015).
- T.Y. Hirsh et al., “*Installation of the Multi Reflection Time Of Flight (MR-TOF) mass separator at the ANL CARIBU facility*”, Poster, EMIS 2015, Michigan, USA (2015).
- T.Y. Hirsh et al., “*Fast neutron target based on based on 5 MeV deuteron beam at SARAF phase I*”, Poster, EURORIB2010 conf., Lamoura, France (2010).
- T.Y. Hirsh, M. Hass, D. Berkovits, et al., “*Intense light radioactive beams for astrophysics and neutrino physics*”, Poster, IPS2008, BG university (2008).
- T.Y. Hirsh, D. Berkovits, M. Hass, et al., “*Intense Production of ⁸Li RIB in SARAF Phase I*”, Poster, Spiral2week, Caen, France (2011).
- T.Y. Hirsh, M. Hass, D. Berkovits, Y. Nir-El, V. Kumar, K. Singh, “*Light radioactive beam production via the two stage irradiation setup*”, Poster, TWIM2008, Weizmann (2008).