

Eilam Gross – Curriculum Vitae & LOP

February 2020

A. Personal details

Eilam Gross

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Place of birth: Israel

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Languages

Hebrew - Fluent Reading, Writing and Speaking

English - Fluent Reading, Writing and Speaking

B. Education

July 1991: Ph.D. in Physics, the Feinberg Graduate School, Weizmann Institute of Science.

Thesis in experimental High Energy Physics (advisors Prof. G. Mikenberg and Prof. E. Duchovni): *Search for the Standard Model Higgs Boson using the OPAL detector at LEP* (thesis submitted Dec. 1990).

September 1986: M.Sc. in Physics with honours, the Feinberg Graduate School, Weizmann Institute of Science. Thesis in theoretical physics (advisor Prof. N. Seiberg): *Consistent Closed Strings*.

September 1984: B.Sc. in Physics with special honours, the Hebrew University in Jerusalem

C. Appointments

March 2017 : Visiting Professor, IAS, University of
Birmingham

January 2013-December 2013: Scientific Associate, CERN, Geneva

July 2012 : Full Professor of Physics, the Weizmann
Institute of Science

November 1998 : Associate Professor of Physics, the Weizmann
Institute of Science

August 1993-November 1998 : Senior researcher, Weizmann Institute of Scientific Associate Science, Rehovot

January 1991- July 1993 : Scientific Associate, CERN, Geneva

D. Academic Roles

April 2020 - Present : Head of the Benozio Center for High Energy Physics, WIS

August 2017: Organiser SRITP Hammers and Nails: Machine Learning and HEP, Weizmann.

May 2017: Fermilab, Member of the International Organizing Committee, Data Science 2017

November 2015: CERN, Switzerland, Member of the International Organizing Committee, Data Science 2015

October 2014 – October 2016 : CERN, Switzerland, , ATLAS convener of ATLA-CMS Higgs combination (LHCHCG)

August 2011 – October 2014: CERN, Switzerland, Convener of ATLAS Higgs group (at the time of the Higgs Boson discovery).

May 2013: Aspen Center for Physics, USA, Chair of the organizing committee of the ACP winter 2013 conference on Higgs Physics.

October 2012: Uppsala, Member of the international advisory committee of Charged 2012 (Prospects for Charged Higgs Discovery at Colliders), Sweden, 8-11 October 2012

Sept 2010 - September 2012: Member of the Executive Board, XENON

E. International Recognition

2018 - Present : Member of the RECFA committee

2017 : Reviewer for the Austrian Academy of Science

2013 - 2018 : Active member of ERC review committees (European Research Committee).

December 2012: The Tenth Oscar Van Leer Medal, Jerusalem.

December 2008: Segre Award, the Weizmann Institute of Science

Review tasks

Reviewer for ERC Grants, BSF Grants, EPJC, PLB and other Research Funding Agencies (national and international)

E. Recent Colloquiums and Seminars

1. September 2016: ICFO: The Barcelona Institute of Science and Technology, Colloquium on the Higgs Discovery
2. April 2016, KITP Santa Barbara: A plenary talk on SM Higgs properties and couplings, UCSB.
3. March 2016: LENS, European Laboratory for Non-Linear Spectroscopy, Florence, Fermi Colloquia on “The Discovery of the Higgs”
4. November 2015 Albert Einstein Center, Universitat Bern, Hands on Higgs Properties from ATLAS and CMS combination
5. September 2015, Lund University, Sweden, A seminar on Higgs properties with the ATLAS and CMS combination.
6. March 2013, Princeton University
- Seminar on Higgs Properties April 2012, Physik Institut Universitaet Zuerich , Higgs Searches at the LHC
7. April 2012, Racah Institute of Physics, Colloquium, Hebrew University, Jerusalem, Towards Higgs Discovery
8. July 2012 – A seminar on Higgs Statistics in Columbia University, NY.
9. January 2012, Freiburg University, Physikalisches Institut, a seminar on Higgs search status.
10. December 2011 , Bonn University, Physikalisches Institut, colloquium on Higgs Searches
11. November 2011, Physik Institut Universitaet Zuerich , Higgs Searches at the LHC

F. Recent Conferences Schools and Invited Talks

1. January 2020: NYU, ML4Jets, a talk on Secondary Vertex finding in Jets with Graph Neural Networks
2. June 2019, Paestum, Italy, INFN School of Statistics, Statistical Inference
3. March 2019, Córdoba Province, Argentina. CERN Latin-American School of High-Energy Physics (CLASHEP), Statistics and ML for HEP
4. January 2019: XII SERB School on Experimental High Energy Physics, TIFR, Mumbai, Statistical Methods and Error Analysis
5. April 2018, CERN Academic Training, Statistics in High Energy Physics

6. April 2018, First EWSB Spring School, Maratea, Italy, lectures on Statistics for HEP.
7. September 2017, The European School of High-Energy Physics Evora, Portugal, Invited Lectures on Practical Statistics for Particle Physics.
8. March 2017: University of Birmingham, Lectures on Statistics in HEP
9. July 2016: University of Melbourne, SUSY 2016, Invited talk on the search for the 750 GeV Scalar with the ATLAS detector at the LHC.
10. February 2016, University of Witwatersrand, Johannesburg , High Energy Particle Physics Workshop 2016 , Lectures on Statistics in High Energy Physics
11. January 2016, RAS, (Royal Astrophysical Society), London, Lectures on Frequentist Statistics
12. September 2015, Taller de Altas Energías 2015, Benasque Spain, Invited Lectures on Higgs Properties and Higgs Statistics.
13. September 2015, The European School of High-Energy Physics Bansko, Bulgaria, Invited Lectures on Practical Statistics for Particle Physics.
14. September 2015: Higgs days at Santander 2015: an invited lecture on ATLAS-CMS Higgs Combination
15. September 2014 – Uppsala, Sweden. The Summary talk of Charged 2014 – Prospects for charged Higgs discovery at colliders
16. July 2014 – John Hopkins University Workshop, Heidelberg, an invited review talk about the SM Higgs Boson
17. April 2014 – Moriond EW 2014, La Thuile, Italy, an invited talk on LHC Higgs Couplings
18. December 2013 – Fysisk Institutt Oslo – An invited talk in celebration of the 2013 Nobel Prize in Physics to Higgs and Englert
19. April 2013 - Universidad San Francisco de Quito - CONFERENCIA "DESCUBRIMIENTO DEL BOSÓN DE HIGGS", a keynote lecture
20. January 2013 – Higgs Center for Theoretical Physics, University of Edinburgh, An invited talk on the Higgs Discovery in the Higgs Symposium
21. July 2012 - SLAC Summer Institute – Invited Lecturer on “Statistics for Discovery”.

G. Most Significant Publications

- 1. Search for the Decay of the Higgs Boson to Charm Quarks with the ATLAS Experiment**
ATLAS Collaboration (Morad Aaboud (Oujda U.) et al.). Feb 12, 2018. 29 pp. CERN-EP-2017-334 e-Print: arXiv:1802.04329 [hep-ex]. Phys. Rev. Lett. 120 (2018) 211802
(70 citations Feb 2020)
(My personal contribution: Charm tag and calibration done by my Weizmann group)
- 2. Measurements of the Higgs boson production and decay rates and constraints on its couplings from a combined ATLAS and CMS analysis of the LHC pp collision data at $\sqrt{s}=7$ and 8 TeV.**
ATLAS and CMS Collaborations (Georges Aad (Marseille, CPPM) et al.). Jun 7, 2016. 70 pp. Published in JHEP 1608 (2016) 045. arXiv:1606.02266 [hep-ex].
(My personal contribution: Co-Convener of ATLAS-CMS combination and Editor)
(1341 citations Feb 2020)
- 3. Combined measurement of the Higgs Boson mass in pp collisions at CM of 7 and 8 TeV with the ATLAS and CMS experiments.** ATLAS and CMS collaborations. Published in Phys.Rev.Lett. 114 (2015) 191803. arXiv:1503.07589 [hep-ex]
(1753 citations, Feb 2020)
(My personal contribution: Co-Convener of ATLAS-CMS combination and Contact Editor)
- 4. Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC.**
ATLAS Collaboration (Georges Aad (Freiburg U.) et al.). Jul 2012. 24 pp. CERN-PH-EP-2012-218 e-Print: arXiv:1207.7214 [hep-ex] , Published in Phys.Lett. B716 (2012) 1-29
(11542 citations, Feb 2020)
(My personal contribution: Convener of ATLAS Higgs group and Editor)
- 5. Asymptotic formulae for likelihood-based tests of new physics**
G. Cowan, K. Cranmer, E. Gross and O. Vitells
Eur. Phys. J. C 71, 1554 (2011) [arXiv:1007.1727 [physics.data-an]]
(2971 citations, Feb 2020)
(Importance of paper: Defined the statistics of the Higgs discovery and most of the searched in the KHC and Astro-Particle DM since then)
- 6. Likelihood Approach to the First Dark Matter Results from XENON100**
E. Aprile et al. [XENON100 Collaboration]
arXiv:1103.0303 [hep-ex] Published in Phys.Rev. D84 (2011) 052003
(172 citations, Feb 2020)
*(Personal Contribution: Editor
Importance of paper: brought frequentist methods to Astro-Particle physics and used since then in DM searches)*
- 7. Dark Matter Results from 100 Live Days of XENON100 Data**
E. Aprile et al. [XENON100 Collaboration]
arXiv:1104.2549 [astro-ph.CO] Published in Phys.Rev.Lett. 107 (2011) 131302
(892 citations, Feb 2020)
(Personal Contribution: A main contributor to the statistical code and derivation of the result)
- 8. Trial factors or the look elsewhere effect in high energy physics**
E. Gross and O. Vitells
Eur. Phys. J. C 70, 525 (2010) [arXiv:1005.1891 [physics.data-an]]
(343 citations, Feb 2020)
(Importance of paper: Solved the open problem of Look Elsewhere Effect in High Energy Physics and used since then in all searches, also outside High Energy Physics)

H. Most Recent Publications

9. **Secondary Vertex Finding in Jets with Neural Networks**, Jonathan Shlomi (Weizmann Inst.), Sanmay Ganguly (Weizmann Inst.), Eilam Gross (Weizmann Inst.), Kyle Cranmer (New York U.), Yaron Lipman (Weizmann Inst.) et al. **(Aug 2020) e-Print: 2008.02831 [hep-ex]**
10. **Efficiency Parameterization with Neural Networks** C. Badiali (Rome U. and INFN, Rome), F.A. Di Bello (Rome U. and INFN, Rome), G. Frattari (Rome U. and INFN, Rome), E. Gross (Weizmann Inst.), V. Ippolito (INFN, Rome) et al. **(Apr 2020) e-Print: 2004.02665 [hep-ex]**
11. **Towards a Computer Vision Particle Flow**, Francesco Armando Di Bello (U. Rome La Sapienza (main) and INFN, Rome), Sanmay Ganguly (Weizmann Inst.), Eilam Gross (Weizmann Inst.), Marumi Kado (U. Rome La Sapienza (main) and INFN, Rome and IJCLab, Orsay), Michael Pitt (CERN) et al. **(Mar 2020) e-Print: 2003.08863 [hep-ex]**