

Andrea Pietro Pocar | PhD

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Education

- Doctor of Philosophy (PhD), Physics** 1998—2003
Princeton University, NJ, USA
Thesis: Low background techniques and experimental challenges for Borexino and its nylon vessels
- Laurea, Physics** 1990—1996
University of Milan, Italy
Thesis: Design and realization of a laser system for testing and developing pixel detectors for the ATLAS experiment at CERN
- Maturità Scientifica** 1985—1990
Liceo Scientifico "R. Donatelli", Milan, Italy

Professional Appointments

- Professor, Physics** 9/2019—present
University of Massachusetts, Amherst, MA, USA
- Associate Director, ACFI** 1/2017—present
Amherst Center for Fundamental Interactions, University of Massachusetts, Amherst, MA, USA
- Associate Professor, Physics** 1/2005—8/2019
University of Massachusetts, Amherst, MA, USA
- Visiting Scholar, Physics** 9/2015—12/2015
Princeton University, NJ, USA
- Visiting Scientist** 1/2015—8/2015
Lawrence Livermore National Laboratory (LLNL), CA, USA
- Assistant Professor, Physics** 1/2009—12/2004
University of Massachusetts, Amherst, MA, USA
- Postdoctoral Scholar (EXO experiment)** 10/2004—12/2008
Gratta group, Department of Physics, Stanford University, CA, USA
- Postdoctoral Scholar (Borexino experiment)** 9/2003—9/2004
Calaprice group, Department of Physics, Princeton University, NJ, USA

Predocctoral Experience

- Research and Teaching Assistant** 6/1998—12/2003
Department of Physics, Princeton University, NJ, USA
- Research Assistant (GLAST Si strip detector R&D)** 8/1997—5/1998
Sadrozinski group, SCIPP, University of California, Santa Cruz, CA, USA
- Research Assistant (ATLAS Pixel detector R&D)** 6/1997—7/1997
Einsweiler group, Lawrence Berkeley National Laboratory (LBNL), CA, USA

Other

- Civil Servant** 6/1995—5/1996
Caritas Ambrosiana/ASP, Milan, Italy

Professional Affiliations

2009—present	DarkSide/GADMC Collaborations
2004—present	EXO/EXO-200/nEXO Collaborations
1998—present	Borexino Collaboration
1999—present	American Physical Society (APS)
1995—1997	Italian Institute for Nuclear Physics (INFN)
1994—1997	Italian Physical Society (SIF)

Professional Service

10/2020—9/2022	BLV 2022 International Workshop, Brussels, Belgium, 6-10 September 2022, International Science Committee
4/2020—present	APS-DPF Snowmass 2021, Rare Processes and Precision Measurements Frontier, Baryon and Lepton Number Violation Topical co-Convener
2/2020—present	Experiment Advisory Committee (EAC), SNOLAB
9/2020—present	Graduate Instrumentation Research Award (GIRA) selection committee (chair since 11/2021)
Dec. 2020	ACFI-Snowmass Workshop on “Beyond the tonne-scale 0ν Double Beta Decay I”, Amherst, MA, USA (virtual), Organizing Committee
July 2020	BLV circa 2020 International Workshop, July 6-8 2021, Case Western Reserve University, Cleveland, OH, USA, (virtual), Co-Organizer
9/19—5/20	DoE-HEP Instrumentation Basic Research Needs, Noble Liquids Technology Panel Member
April 2019	ACFI Workshop on “Neutrino-Electron Scattering at Low Energy”, Amherst, MA, USA, Organizing Committee
10/31—11/3/2017	ACFI School on the “Physics Double Beta Decay”, Amherst, MA, USA, Organizing Committee
2015	BLV 2015 International Workshop, Amherst, MA, USA, Science Advisory and Local Organizing Committee
Panel reviewer	DoE, NSF, INFN
Ad-hoc reviewer	DoE, DoE-SBIR, NSF, NSERC (Canada), SNF (Switzerland), FSC (Portugal)
Journal reviewer	Particle Data Group, Nature Phys., EPJC, JINST, NIMA, IEEE/NSS, Frontiers in Phys., Arab. J. Chem., AJP
Book reviewer	MIT Press

Honors and Awards

- 2021 Giuseppe and Vanna Cocconi Prize, EPS, to the Borexino Collaboration “for their ground-breaking observation of solar neutrinos from the *pp* chain and CNO cycle that provided unique and comprehensive tests of the Sun as a nuclear fusion engine” [[link](#)]
- 2020 Borexino collaboration: PhysicsWorld Top Ten Breakthroughs of the Year Finalist “for observing neutrinos from the carbon–nitrogen–oxygen (CNO) cycle in the Sun” [[link](#)]
- 2015 Business Insider “50 groundbreaking scientists who are changing the world”
- 2014 Borexino collaboration: PhysicsWorld Top Ten Breakthroughs of the Year Finalist “for being the first to detect neutrinos from the main nuclear reaction that powers the Sun” [[link](#)]

Outreach and Synergistic Activities

- 2021-2022 UMass ADVANCE Faculty Fellow
- 6/2/2018 Panelist, 'Salon' event on “The Yin and Yang of the Big Bang: Neutrinos, Matter and Antimatter” World Science Festival, New York City, NY, USA ([link](#), [youtube](#))
- 2/2/2013 Everyday particle physics, STEM Science & Engineering Saturday Seminars, UMass Amherst
- 7/2004 Lecturer and founding member, 1st Gran Sasso-Princeton Summer School, July 2004, Princeton, NJ, USA

nEXO and EXO-200 positions and responsibilities

- 2014—present nEXO Collaboration Board, UMass Representative
(Chair 9/2017—10/2021)
The Board determines the overall scientific direction of the program, handles membership actions and publication policies, defines the collaboration code of conduct, and deals with matters relating to funding agencies and international cooperation. I am currently serving for a second two-year term.
- 9/2017—present nEXO Executive Council, Member
Main advisory body for the Spokesperson, currently composed of eight members. Membership automatic with Board membership
- 1/2009—present EXO/EXO-200 Collaboration Board*, UMass Representative
** In 2014, the EXO Collaboration gave rise to two separate collaborations, EXO-200 and nEXO, each with its independent management structure. Each Board is composed of one representative per member institution. nEXO currently includes approximately 170 collaborators from 32 member institutions in seven countries. EXO-200 includes approximately 85 collaborators from 26 member institutions in seven countries.*
- 12/2021—present nEXO Social Media Board
- 10/2021—present nEXO Speakers Coordinator
and 2009—2014 *Person in charge of requesting talks and posters at conferences and workshops on behalf of the collaboration and identifying available speakers*
- 2012—2014 EXO Advisory Board, Member
A six-person, rather informal advisory body for the Spokesperson (replaced by the nEXO Executive Council in 2014)
- 2015 NSAC Subcommittee for Double Beta Decay nEXO document preparation
The content of this document was incorporated in the 2015 NSAC report, which identified a tonne-scale neutrino-less double beta decay as the highest construction priority for nuclear physics.
- 2019—present nEXO Project Level-2 Scientist (TPC support systems group)
This group oversees the cryostat, cryogenic systems and fluid handling, purification, and storage.
- 2014—2019 nEXO R&D Level-2 Manager (TPC group)
One of nine nEXO L2 R&D groups. Tasked with the layout of the nEXO Time Projection Chamber (TPC) detector according to the tightest radio-purity constraints, including the design of the field-shaping and cathode electrodes, of the development of the charge readout detector (anode), and the mechanical installation of the light detector, interconnections, and electronics).
- 2010—2011 EXO-200 Analysis Coordinator
One of two co-coordinators (with Prof. Kevin Graham, Carleton University) for parallel, competing analysis for the first EXO-200 publication reporting the discovery of 2-neutrino double beta decay of Xe-136.

nEXO research activities and interests

- 2014—present Physics topics, data analysis and simulations
- discovery potential for 0-neutrino double beta decay of Xe-136
 - neutrino, cosmogenic, and radon-daughter backgrounds

- *scintillation light collection optimization , charge detection characterization*

Detector R&D, hardware

- *Cryostat, cryogenics, fluid handling, purification, and storage*
- *Ultra-low background materials, thin films, dielectrics, resistive electrodes*
- *TPC integration with High Voltage delivery system, electronics, photosensors, calibration hardware*
- *Tests of Silicon PhotoMultipliers (SiPMs) in liquid Xenon (LXe) at UMass*
- *Cathode electrode optimization and prototyping*
- *Calibration strategies, Radon injectable sources*
- *Low-radon environments for nEXO assembly*
- *Large-scale Xenon procurement and enrichment*

EXO-200 research activities and interests

2004—present

Physics topics, data analysis and simulations

- *Xe-136 double beta decay (0- and 2-neutrino)*
- *Cosmogenic backgrounds, Xe-137, neutrons*
- *Xe-136 double beta decay to excited states of Ba-136, multi-site event topologies*
- *Xe-134 double beta decay, Kr-85 background, ionization-only analysis, low energy threshold*
- *Scintillation light collection efficiency*

2009—2019

Commissioning, operations and decommissioning

- *First (natural) xenon liquefaction in 2011, on-site expert shifter*
- *“Deradonator”: on-site radon-abating system, designed and built at UMass*
- *Rn-220 injectable calibration source, assembled at UMass*

2004—2008

Inner detector design and construction

- *Responsible for design, assembly, and cleanliness standards of TPC*
- *Initial cryogenic commissioning*
- *Silicon Large-Area Avalanche Photodiode (LAAPD) characterization*
- *Production of photo-etched flat cables, cathode electrode, and ionization charge collection wires*
- *Precision cleaning techniques*
- *Development and operation of first-ever liquid xenon detector operated in an all-PTFE vessel*

DarkSide positions and responsibilities

2009—present

DarkSide Institutional Board, UMass Representative

The Board determines the overall scientific direction of the program and, via sub-committees, handles matters of membership, publication, and regulates the relations with funding agencies. The DarkSide program manages two main scientific projects: DarkSide-50 (DS-50), with approximately 170 members from seven countries, and DarkSide-20k (DS-20k) with approximately 300 collaborators from fourteen countries.

3/2017—6/2021

DarkSide Membership Committee, Chair

Committee of seven that reviews membership applications. The Chair was involved in the 2017 merger of the DarkSide and DEAP collaborations to form the Global Argon Dark Matter Collaboration (GADMC). I am serving for a second term.

2017

US Cosmic Visions white paper DarkSide section co-editor

DarkSide-20k research activities and interests

2014—present

Physics topics, data analysis and simulations

- Discovery potential for "high-mass" WIMPs (>few tens GeV mass)
- Discovery potential of a 1-tonne-scale detector to "low-mass" dark matter particles (<10 GeV mass)
- Radon-daughter and Krypton-85 backgrounds

2014—present

Detector R&D, design, commissioning

- SiPM optical plane installation
- Silicon Photomultiplier (SiPM) tile packaging, protective epoxy coatings, through-silicon vias
- Low-radioactivity materials: procurement and requirements

2017—present

URANIA system

- Plant tender preparation
- Site preparation in Cortez, CO, USA

DarkSide-50 research activities and interests

2009—present

Physics topics, data analysis and simulations

- Search for high- and low-mass dark matter
- Radon-daughter, α -decay backgrounds
- Ion fraction of Rn progeny, ion mobility in liquid argon
- Krypton-85 background

2009—present

Design, commissioning, and operations

- Electron extraction grid: design, production, installation
- Low-radon clean room system, consultant
- Electrostatic radon detector for low-radon clean room monitoring: design, procurement, installation
- PTFE reflector system design
- DS-10 prototype electron extraction grid; DS-10 commissioning and operations

Borexino positions and responsibilities

2013—2017 Borexino Institutional Board, UMass Representative

The Board determines the overall scientific direction of the experiment, handles matters of membership and publication, and regulates the relations with funding agencies. Borexino is a collaboration of approximately 100 scientists from six countries. In 2017, a rule was passed that groups with less than two active scientists will not sit at the Institutional Board.

2012—2017 Borexino Steering Committee

The Committee deliberates in matters of science priorities and detector operations

Borexino research activities and interests

1998—present Physics topics, data analysis and simulations

- Solar neutrinos (*Be-7, B-8, pep, pp, CNO*), *geo-neutrinos*
- *Lead editor for 2014 pp solar neutrino discovery paper*
- *Cosmogenic backgrounds, Carbon-11 suppression*
- *Carbon-14 pile-up background*

1998—present Design, commissioning, and operations

- *Scintillator containment nylon vessel: R&D, design, construction, leak-testing, commissioning, installation, fluid filling*
- *Scintillator handling system, testing and commissioning*
- *Radon-daughter plate-out and wash-off (Lead-210, Bismuth-210, Polonium-210)*
- *Ultra-low radioactivity handling, packaging, cleaning*
- *First-ever demonstration of vacuum-swing adsorption (VSA) radon-abatement system for clean room air: R&D, prototyping, design, construction, commissioning, operation*

Teaching

- S22 “What Do We Know About the Cosmos?”, Hon. Sem., HON391AH (UMass)
Materials — Lyman Page, “The Little Book of Cosmology” (enrollment: ~15)
- F21, F22 “Time, Life, and Quantum Mechanics”, Hon. Sem., HON391AH (UMass)
Materials — E. Schrödinger, “What is Life?”; Carlo Rovelli, “The Structure of Time” (enrollment: ~15)
- F20, F21 Nuclear and Particle Physics, PHY556/714 (UMass)
Materials — Griffiths (enrollment: ~15)
- S20, S21, S22 Graduate Electro-Magnetism, PHY606 (UMass)
Materials — Jackson, Zangwill (enrollment: ~15)
- S20 Honors Seminar, HON391AH (UMass)
- F16, S17, S18, S19 Introductory Electro-Magnetism, PHY152 (UMass)
Freshman physics, mostly for engineers, occasionally for physics majors
(enrollment: 140)
Materials — Knight, *Physics for Scientists and Engineers*
OpenStax, *University Physics* (vol. 2)
MasteringPhysics (online homework)
1-credit honors section offered S19 semester (5 students)
- S16, S17, S18, S19 Intermediate E&M, PHY422 (UMass)
Upper division physics course, first semester (enrollment: 40-50).
Materials — Griffiths, *Introduction to Electrodynamics*
1-credit honors section offered in S19 (5 students)
- F15 Introductory Mechanics, PHY103 (Princeton)
Freshman physics, mostly for engineers (enrollment: 25)
- F13, F14 Energy and Society, PHY118 (UMass)
Non-calculus-based course for non-scientists (enrollment: 120)
- S12, S13, S14 Physics of Sound, PHY114 (UMass)
Non-calculus course for non-scientists and Communication Disorders majors
(enrollment: 100-120)
Materials — Speaks, *Introduction to Sound*
Mullin et al., *Fundamentals of Sound with Applications to Speech*
Praat software (<http://www.fon.hum.uva.nl/praat/>)
- F09, F11, F12 Quantum Mechanics, PHY424 (UMass)
Upper division physics course, first semester (enrollment: 25-30).
Textbook — Griffiths, *Quantum Mechanics*
1-credit honors section offered every semester (4-8 students)
- S09, S10, S11 Advanced Laboratory, PHY440 (UMass)
Upper division physics laboratory, 3-4 experiments per semester (enrollment: 16)
- 8/27/2010 Direct Dark Matter Detection, 5th CERN-Fermilab Hadron Collider Physics
Summer School, August 15-27, 2010, Fermilab, Batavia, IL, USA
(lecture video available at: <https://indico.fnal.gov/event/3532/>)
- 8/2009 Low background techniques in particle physics: an introduction, New England
Particle Physics Student Retreat (NEPPSR), August 11-15, 2009, Craigville
Conference Center, Cape Cod, MA, USA

Publications

A list of publications is found on [Google Scholar](#).

Note The list of publications below is divided by research programs, with the following categories each presented in reverse chronological order:

- EXO, including EXO-200, nEXO and related works
- DarkSide, including DS-10, DS-50, and DS-20k and related works
- Borexino, including CTF and related works
- Other
- Conference Proceedings

Legend: +main editor, *editor, &involved in work, =internal reviewer

EXO and related papers

- E-51 A. Avasthi et al., Kilotonne-scale xenon detectors for neutrinoless double beta decay and other new physics searches, *Phys. Rev. D* 104, 112007 (2021); arXiv:2110.01537
- E-50 EXO-200 collaboration, S. Al Kharusi et al., Search for Majoron-emitting modes of ^{136}Xe double beta decay with the complete EXO-200 dataset, *Phys. Rev. D* (2021); arXiv:2109.01327
- &E-49 EXO-200 collaboration, N. Ackerman et al., The EXO-200 detector, part II: Auxiliary systems, *JINST* (2021); arXiv:2104.07997
- =&E-48 nEXO collaboration, S. Al Kharusi et al., nEXO: Neutrinoless double beta decay search beyond 10^{28} year half-life sensitivity, *J. Phys. G* (2021); arXiv:2106.16243
- E-47 nEXO collaboration, T. Wagenpfeil et al., Reflectivity of VUV-sensitive Silicon Photomultipliers in Liquid Xenon, *JINST* 16, P08002 (2021), doi.org/10.1088/1748-0221/16/08/P08002; arXiv:2104.07997
- =&E-46 nEXO collaboration, T. Stiegler et al., Event Reconstruction in a Liquid Xenon Time Projection Chamber with an Optically-Open Field Cage, *Nucl. Instr. Meth. A* 1000, 165239 (2021); doi.org/10.1016/j.nima.2021.165239; arXiv:2009.10231
- =&E-45 EXO-200 collaboration, G. Anton et al., Measurement of the Spectral Shape of the β -decay of ^{137}Xe to the Ground State of ^{137}Cs in EXO-200 and Comparison with Theory, *Phys. Rev. Lett.* 124, 232502 (2020); doi.org/10.1103/PhysRevLett.124.232502; arXiv:2002.00108
- E-44 nEXO collaboration, P. Lv et al., Reflectance of Silicon Photomultipliers at Vacuum Ultraviolet Wavelengths, *IEEE TNS* doi.org/10.1109/TNS.2020.3035172 (2018); arXiv:1912.01841
- =E-43 nEXO collaboration, O. Njoya et al., Measurements of electron transport in liquid and gas Xenon using a laser-driven photocathode, *Nucl. Instr. Meth. A* 972, 163965 (2020); doi.org/10.1016/j.nima.2020.163965; arXiv:1911.11580
- =E-42 nEXO collaboration, P. Nakarmi et al., Reflectivity and PDE of VUV4 Hamamatsu SiPMs in Liquid Xenon, *J. Inst.* 15 P01019 (2020); arXiv:1910.06438
- E-41 EXO-200 collaboration, G. Anton et al., Measurement of the scintillation and ionization response of liquid xenon at MeV energies in the EXO-200 experiment, *Phys. Rev. C* 101, 065501 (2020); arXiv:1908.04128
- E-40 nEXO collaboration, Z. Li et al., Simulation of charge readout with segmented tiles in nEXO, *J. Inst.* 14, P09020 (2019); arXiv:1907.07512

- &E-39 EXO-200 collaboration, G. Anton et al., Search for Neutrinoless Double-Beta Decay with the Complete EXO-200 Dataset, *Phys. Rev. Lett.* 123, 161802 (2019); arXiv:1906.02723
- =*E-38 nEXO collaboration, G. Gallina et al., Characterization of the Hamamatsu VUV4 MPPCs for nEXO, *Nucl. Instr. Meth. A* 940, 371 (2019); arXiv:1903.03663
- =E-37 nEXO collaboration, C. Chambers et al., Imaging individual Ba atoms in solid xenon for barium tagging in nEXO, *Nature* 569, 203 (2019); arXiv:1806.10694
- =E-36 nEXO collaboration, X.L. Sun et al., Study of silicon photomultiplier performance in external electric fields, *J. Inst.*, 13 T09006 (2018); arXiv:1807.03007
- =E-35 nEXO collaboration, A. Jamil et al., VUV-sensitive Silicon Photomultipliers for Xenon Scintillation Light Detection in nEXO, *IEEE TNS* doi:10.1109/TNS.2018.2875668 (2018); arXiv:1806.02220
- *&E-34 nEXO collaboration, S. Al Kharusi et al., nEXO Pre-Conceptual Design Report, arXiv:1805.11142
- E-33 EXO-200 collaboration, S. Delaquis et al., Deep Neural Networks for Energy and Position Reconstruction in EXO-200, *J. Inst.* 13, P08023 (2018); arXiv:1804.09641
- *&E-32 nEXO collaboration, J.B. Albert et al., Sensitivity and Discovery Potential of nEXO to Neutrinoless Double Beta Decay, *Phys. Rev. C* 97 065503 (2018); arXiv:1710.05075
- E-31 EXO-200 collaboration, J.B. Albert et al., Search for Nucleon Decays with EXO-200 *Phys. Rev. D* 97, 072007 (2018); arXiv:1710.07670
- *&E-30 nEXO collaboration, M. Jewell et al., Characterization of an Ionization Charge Readout Tile for a Liquid Xenon Time Projection Chamber, *J. Inst.* 13, P01006 (2018); arXiv:1710.05109
- &E-29 EXO-200 collaboration, J.B. Albert et al., Search for Neutrinoless Double-Beta Decay with the Upgraded EXO-200 Detector, *Phys. Rev. Lett.* 120, 072701 (2018); arXiv:1707.08707
- =&E-28 EXO-200 collaboration, J.B. Albert et al., Searches for Double Beta Decay of ^{134}Xe with EXO-200, *Phys. Rev. D* 96, 092001 (2017); arXiv:1704.05042
- &E-27 EXO-200 collaboration, D.S. Leonard et al., Trace radioactive impurities in final construction materials for EXO-200, *Nucl. Instr. Meth. A* 871, 169 (2017); arXiv:1703.10799
- =E-26 EXO-200 collaboration, J.B. Albert et al., Measurement of the Drift Velocity and Transverse Diffusion of Electrons in Liquid Xenon with the EXO-200 Detector, *Phys. Rev. C* 95, 025502 (2017); arXiv:1609.04467
- E-25 EXO-200 collaboration, C. Davis et al., An Optimal Energy Estimator to Reduce Correlated Noise for the EXO-200 Light Readout, *J. Inst.* 11, P07015 (2016); arXiv:1605.06552
- E-24 EXO-200 collaboration, J.B. Albert et al., First search for Lorentz and CPT violation in double beta decay with EXO-200, *Phys. Rev. D* 93, 072001 (2016); arXiv:1601.07266
- =&E-23 EXO-200 collaboration, J.B. Albert et al., Cosmogenic backgrounds to $0\nu\beta\beta$ in EXO-200, *JCAP* 4, 29 (2016); arXiv:1512.06835
- &E-22 EXO-200 collaboration, J.B. Albert et al., Search for $2\nu\beta\beta$ decay of ^{136}Xe to the 0_1^+ excited state of ^{136}Ba with EXO-200, *Phys. Rev. C* 93, 035501 (2016); arXiv:1511.04700
- =&E-21 EXO-200 collaboration, J.B. Albert et al., Measurements of the ion fraction and mobility of alpha and beta decay products in liquid xenon using EXO-200, *Phys. Rev. C* 92 045504 (2015); arXiv:1503.00317
- =E-20 EXO-200 collaboration, J.B. Albert et al., Investigation of radioactivity-induced backgrounds in EXO-200, *Phys. Rev. C* 92, 015503 (2015); arXiv:1503.06241

- E-19 nEXO collaboration, T. Brunner et al., An RF-only ion-funnel for extraction from high-pressure gases, *Int. J. Mass. Spec.* 379, 110 (2015); arXiv:1412.1144
- E-18 nEXO collaboration, B. Mong et al., Spectroscopy of Ba and Ba⁺ deposits in solid xenon for barium tagging in nEXO, *Phys. Rev. A* 91, 022505 (2015); arXiv:1410.2624
- E-17 EXO-200 collaboration, J.B. Albert et al., Search for Majoron-emitting modes of double-beta decay of ¹³⁶Xe with EXO-200, *Phys. Rev. D* 90, 092004 (2014); arXiv:1409.6829
- E-16 K. Twelker et al., An apparatus to manipulate and identify individual Ba ions from bulk liquid Xe, *Rev. Sci. Instr.* 85, 095114 (2014); arXiv:1407.0618
- &E-15 EXO-200 collaboration, J.B. Albert et al., Search for Majorana neutrinos with the first two years of EXO-200 data, *Nature*, 510, 229 (2014); arXiv:1402.6956
- &E-14 EXO collaboration, J.B. Albert et al., An improved measurement of the 2νββ half-life of ¹³⁶Xe with EXO-200, *Phys. Rev. C* 89 015502 (2014); arXiv:1306.6106
- &E-13 EXO collaboration, M. Auger et al., Search for Neutrinoless Double-Beta Decay in ¹³⁶Xe with EXO-200, *Phys. Rev. Lett.* 109, 032505 (2012); arXiv:1205.5608
- &*E-12 EXO collaboration, M. Auger et al., The EXO-200 detector, part I: Detector design and construction, *J. Inst.* 7, P05010 (2012); arXiv:1202.2192
- E-11 EXO collaboration, A. Dobi et al., Xenon purity analysis for EXO-200 via mass spectrometry, *Nucl. Instr. Meth. A.* 675, 40 (2012); arXiv:1109.1046
- =&E-10 EXO collaboration, N. Ackerman et al., Observation of Two-Neutrino Double-Beta Decay in Xe-136 with EXO-200, *Phys. Rev. Lett.* 107, 212501 (2011); arXiv:1108.4193
- E-9 EXO collaboration, A. Dobi et al., A xenon gas purity monitor for EXO, *Nucl. Instr. Meth. A* 659, 215 (2011); arXiv:1106.1812
- &E-8 EXO collaboration, F. LePort et al., A magnetically-driven piston pump for ultra-clean applications, *Rev. Sci. Instr.* 82, 105114 (2011); arXiv:1104.5041
- E-7 EXO collaboration, M. Montero-Díez et al., A simple radionuclide-driven single-ion source, *Rev. Sci. Instr.* 81, 113301 (2011); arXiv:1008.3422
- &*E-6 EXO collaboration, R. Neilson et al., Characterization of large area APDs for the EXO-200 detector, *Nucl. Instr. Meth. A* 608, 68 (2009); arXiv:0906.2499
- &*E-5 EXO collaboration, D. Leonard et al., Systematic study of trace radioactive impurities in candidate construction materials for EXO, *Nucl. Instr. Meth. A* 591, 490 (2008); arXiv:0709.4524
- E-4 P. Fierlinger et al., A microfabricated sensor for thin dielectric layers, *Rev. Sci. Instr.* 79, 045101 (2008); arXiv:0706.0540
- E-3 EXO collaboration, M. Green et al., Observation of single collisionally cooled trapped ions in a buffer gas, *Phys. Rev. A* 76, 023404 (2007); arXiv:physics/0702122
- &+E-2 EXO collaboration, F. LePort et al., A liquid xenon ionization chamber in an all-fluoropolymer vessel, *Nucl. Instr. Meth. A* 578, 409 (2007); arXiv:physics/0611183
- E-1 EXO collaboration, B. Flatt et al., A linear RFQ ion trap for the Enriched Xenon Observatory, *Nucl. Instr. Meth. A* 578, 399 (2007); arXiv:0704.1646

DarkSide and related papers

- D-28 DarkSide-50 collaboration, P. Agnes et al., Calibration of the liquid argon ionization response to low energy electronic and nuclear recoils with DarkSide-50, *Phys. Rev. D* 104, 082005 (2021), doi.org/10.1103/PhysRevD.104.082005; arXiv:2107.08087
- &D-27 DarkSide-50 collaboration, P. Agnes et al., A study of events with photoelectric emission in the DarkSide-50 liquid argon Time Projection Chamber, submitted to *Astropart. Phys.* (2021); arXiv:2107.08015
- D-26 DarkSide-20k and ARIA collaborations, P. Agnes et al., Separating ^{39}Ar from ^{40}Ar by cryogenic distillation with Aria for dark matter searches, *Eur. Phys. J. C* 81:359 (2021), doi.org/10.1140/epjc/s10052-021-09121-9; arXiv:2001.08686
- D-25 DarkSide-20k collaboration, P. Agnes et al., Sensitivity of future liquid argon dark matter search experiments to core-collapse supernova neutrinos, *JCAP* 03, 043 (2021), doi.org/10.1088/1475-7516/2021/03/043; arXiv:2011.07819
- *&D-24 K. Pelczar, G. Zuzel, M. Wójcik, A. Pocar, and An. Ianni, An online radon monitor for low-background detector assembly facilities, *Eur. Phys. J. C* 81:86 (2021), doi.org/10.1140/epjc/s10052-020-08793-z
- D-23 DarkSide-20k collaboration, C.E. Aalseth et al., SiPM-matrix readout of two-phase argon detectors using electroluminescence in the visible and near infrared range, *Eur. Phys. J. C* 81:153 (2021); arXiv:2004.02024
- D-22 DarkSide-50 collaboration, P. Agnes et al., Effective field theory interactions for liquid argon target in DarkSide-50 experiment, *Phys. Rev. D* 101, 062002 (2020); arXiv:2002.07794
- *D-21 DarkSide-20k collaboration, C.E. Aalseth et al., Design and construction of a new detector to measure ultra-low radioactive-isotope contamination of argon, *J. Inst.* 15, P02024 (2019); arXiv:1907.09332
- *&D-20 DarkSide collaboration, P. Agnes et al., Measurement of the ion fraction and mobility of ^{218}Po produced in ^{222}Rn decays in liquid argon, *J. Inst.* 14, P11018 (2019); arXiv:1907.09332
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Borexino and related papers

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- B-58 Borexino collaboration, M. Agostini et al., First Directional Measurement of sub-MeV Solar Neutrinos with Borexino, submitted to *Phys. Rev. Lett.* (2021); arXiv:2112.11816
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- *B-56 Borexino collaboration, M. Agostini et al., Identification of the cosmogenic ^{11}C background in large volumes of liquid scintillators with Borexino, *Eur. Phys. J. C.* 81, 1075 (2021); doi.org/10.1140/epjc/s10052-021-09799-x; arXiv:2106.10973
- *B-55 Borexino collaboration, M. Agostini et al., Search for low-energy neutrinos from astrophysical sources with Borexino, *Astropart. Phys.* 125 102509 (2021); doi.org/10.1016/j.astropartphys.2020.102509; arXiv:1909.02422
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- B-51 Borexino collaboration, M. Agostini et al., Comprehensive geoneutrino analysis with Borexino, *Phys. Rev D* 101, 012009 (2019); arXiv:1909.02257
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- B-29 Borexino collaboration, G. Bellini et al., Search for Solar Axions Produced in $p(d,3\text{He})\text{A}$ Reaction with Borexino Detector, *Phys. Rev D* 85, 092003 (2012); arXiv:1203.6258
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Other papers

- &O-5 A. Abba et al., The novel Mechanical Ventilator Milano for the COVID-19 pandemic, Physics of Fluids; arXiv:1707.04591
- *O-4 M. Battaglieri et al., US Cosmic Visions: New Ideas in Dark Matter 2017: Community Report, arXiv:1707.04591
- *O-3 A. Aprahamian et al., Fundamental symmetries, neutrinos, neutrons, and astrophysics: a White Paper on progress and prospects, 2015 ()
- O-2 C. Adams et al., The intermediate neutrino program, arXiv:1503.06637

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Conference proceedings

- CP-8 A. Pocar on behalf of the nEXO collaboration, The nEXO detector: design overview, (TAUP 2019, Toyama, Japan, 4-9 September, 2019)
- CP-7 A. Pocar on behalf of the Borexino collaboration, Solar Neutrino Measurements, (PIC2018, Bogotá, Colombia, 4-9 September, 2018); arXiv:1812.02326
- CP-6 A. Pocar on behalf of the Borexino collaboration, Solar Neutrino Physics with Borexino, SciPost Conf. Proc. (TAU2018, Amsterdam, The Netherlands, 24-28 September, 2018); arXiv:1810.12967
- CP-5 A. Pocar and the EXO-200 Collaboration, Liquid xenon purification, de-radonation (and de-kryptonation), AIP Conf. Proc. 1672, 060001 (LRT2015, Seattle, WA, USA, 18-20 March, 2015)
- CP-4 A. Pocar on behalf of the EXO-200 and the nEXO collaborations, From EXO-200 to nEXO, Proc. Science 244, 49 (Neutrino Telescopes, Venice, Italy, 2-6 March, 2015)
- CP-3 A. Pocar on behalf of the EXO-200 and the nEXO collaborations, Searching for neutrino-less double beta decay with EXO-200 and nEXO, Nucl. Part. Phys. Proc. 42, 265 (2015) (NOW2014, Otranto, Italy, 7-14 September, 2014)
- CP-2 A. Pocar et al., ^{11}C background in liquid scintillator detectors, AIP Conf. Proc. 785, 248 (LRT2004, Sudbury, ON, Canada, 12-13 September, 2004)
- CP-1 A. Pocar et al., Low background techniques for the Borexino nylon vessels, AIP Conf. Proc. 785, 153 (LRT2004, Sudbury, ON, Canada, 12-13 September, 2004)

Conference presentations

- 9/2020 Measurement of CNO neutrinos with Borexino, ICNFP 2020, 9th International Conference on New Frontiers in Physics, September 4-12, 2019, Kolybari, Crete, Grece (delivered virtually)
- 7/2020 Baryon and Lepton Number Violating Processes — The experimental perspective, Snowmass 2021, Rare Processes and Precision Measurements Frontier, July 27, 2020 (delivered virtually)
- 7/2020 Neutrinoless Double Beta Decay beyond the ‘Tonne-Scale’, BLV circa 2020 Workshop, July 6-8, 2020 (delivered virtually)
- 12/2019 Neutrinoless double beta decay with nEXO, CPAD 2019, Instrumentation Frontier Workshop, Dec 8-10, 2019, Madison WI, USA
- 11/2019 (α, n) backgrounds in nEXO, Workshop on (α, n) yield in low background experiments, Nov 21-22, 2019, Madrid, Spain
- 11/2019 Review of Double Beta Decay Experiments, NNN 2019, 20th International Workshop on Next generation Nucleon Decay and Neutrino Detectors, Nov 7-9, 2019, Medellin, Colombia

- 9/2019 The nEXO detector: design overview, TAUP 2019, 16th Int'l Conf. on Topics in Astroparticle and Underground Physics, September 9-13, 2019, Toyama, Japan
- 8/2019 Dark matter searches with the DarkSide experiment, ICNFP 2019, 8th International Conference on New Frontiers in Physics, August 21-29, 2019, Kolybari, Crete, Grece
 Neutrinoless Double Beta Decay with nEXO, ICNFP 2019, 8th International Conference on New Frontiers in Physics, August 21-29, 2019, Kolybari, Crete, Grece
 Physics with Neutrinos, HiX 2019, 5th International Workshop on Nucleon Structure at Large Bjorken x, August 16-21, 2019, Kolybari, Crete, Grece (guest lecture)
- 7/2019 The Search for Neutrinoless Double Beta with EXO-200, APS-DPF 2019, July 29 - August 2, 2019, Boston MA, USA
 nEXO, Future Projects Workshop, July 15-17, 2019, SNOLAB, Sudbury, ON, Canada
- 5/2019 Solar Neutrino Physics with Borexino, CoSSURF 2019, Conference on the Science at the Sanford Underground research Facility, May 15-17, 2019, Rapid City, SD, USA
- 4/2019 Toward Tonne-scale Neutrinoless Double Beta Decay Experiments, APS April 2019 Meeting, April 13-17, 2019, Denver CO, USA
- 9/2018 Solar Neutrino Physics with Borexino, TAU 2018, 15th International Conference on Tau Lepton Physics, 24-28 September, 2018, Amsterdam, The Netherlands
 Solar Neutrino Measurements, PIC2018, XXXVII International Symposium on Physics in Collision, 11-15 September, 2018, Bogotá, Colombia
- 8/2018 DarkSide latest results and prospects, XXV Rencontres du Vietnam, 5-11 August, 2018, Qui Nhon, Vietnam
- 6/2018 The nEXO TPC: High Voltage Design R&D, Neutrino XXXVIII, 4-9 June, 2018, Heidelberg, Germany (poster, with Peter Rowson, SLAC)
- 5/2017 Review of dark matter searches using noble liquid detectors, LDMA workshop, 24-28 May, 2017 Elba, Italy
- 10/2016 Exploring the Unknown: Future of $0\nu\beta\beta$ searches, CPAD Instrumentation Frontier 2016, 8-10 October, 2016, Caltech, Pasadena CA, USA
- 6/2016 Searches for neutrinoless double beta decay with xenon detectors: current status and future prospect, MIAPP topical workshop on baryogenesis, 6-8 June, 2016, Max Planck Institut für Astrophysik, Garching, Germany
- 10/2015 Liquid Xe detectors for double beta decay and connection with large LAr detectors, NNN15, International Workshop for the Next Generation Nucleon Decay and Neutrino Detector, October 28-31, Stony Brook NY, USA
- 9/2015 Non-accelerator, non-reactors neutrino results, PIC2015, XXXIV International Symposium on Physics in Collision, September 15-19, 2015, Warwick, UK
- 8/2015 Solar and terrestrial neutrino physics with Borexino, SLAC Summer Institute (SSI) 2015, SLAC, Menlo Park CA, USA
- 6/2015 Beyond DarkSide-50 Very Large Argon TPCs for Heavy WIMP Searches, Berkeley Workshop on Dark Matter Detection, June 8-9, 2015, Berkeley CA, USA
- 3/2015 Liquid xenon purification: de-radonation (and de-kryptonation), LRT2015, 18-20 March, 2015, Seattle WA, USA
 From EXO-200 to nEXO, XVI International Workshop on Neutrino Telescopes, March 2-6, 2015, Venice, Italy

- 12/2014 The DarkSide program, Nuclear Aspects of Dark Matter, December 8-12, 2014, Institute for Nuclear Theory, Seattle WA, USA
- 9/2014 Searching for neutrino-less double beta decay with EXO-200 and nEXO, Neutrino Oscillations Workshop (NOW) 2014, September 7-14, 2014, Conca Specchiulla, Italy
- 3/2013 Search for Neutrino-less Double Beta Decay with EXO, IPA 2013, May 13-15, 2013, Madison, WI, USA
- 9/2012 The DarkSide program, Shanghai Particle Physics and Cosmology Symposium (SPSC) 2012, September 15-16, 2012, Jiao Tong University, Shanghai, China
- 5/2012 Neutrino-less double beta decay search with EXO-200, Frontier Detectors for frontier Physics, May 21-25, 2012, La Biodola, Isola d'Elba, Italy
- 3/2012 Latest results from Borexino, LVNU12, March 3, 2012, Indiana University, Bloomington, IN, US
- 11/2011 Latest results from Borexino, DBD11, November 14-17, 2011, Osaka, Japan
- 9/2011 EXO and DarkSide: double beta decay and dark matter searches with noble liquid detectors, PAVI 2011, September 5-9, 2011, Rome, Italy
- 6/2011 The Quest for Neutrino-less Double Beta Decay, TIPP 2011, 2nd International Conference on Technology and Instrumentation in Particle Physics, June 9-14, 2011, Chicago, IL, USA
- 12/2010 Solar and terrestrial neutrino science with Borexino at Gran Sasso, SILAF AE 2010, VIII Latin American Symposium on High Energy Physics, December 6-12, 2010, Valparaiso, Chile
- 11/2009 DarkSide (and MAX), Xenon Workshop, November 18, 2009, LBL, Berkeley, CA, USA

Invited Talks

- 11/10/2021 The Borexino Story — A Personal Account, Physics Colloquium, UMass Amherst
- 1/19/2021 Observation of CNO neutrinos with Borexino, HEP Seminar, UC San Diego (virtual)
- 4/23/2020 Why neutrinos masses, why so little?, Experimental Seminar, SLAC (virtual)
- 10/7/2019 Why do neutrinos have mass?, LNS Colloquium, MIT
- 1/23/2019 Neutrino physics without neutrinos: Probing fundamental symmetries of nature with neutrino-less double beta decay, Physics colloquium, UMass Amherst
- 11/15/2018 Dark matter searches with the DarkSide experiment, IKP seminar, Jülich Forschungszentrum, Germany
- 11/13/2018 Searching for neutrinoless double beta decay with EXO-200 and nEXO, Physics Institute 3b seminar, RWHS Aachen, Germany
- 11/24/2017 Recent results from EXO-200 and progress towards nEXO, Scientific Committee meeting special seminar, Laboratorio Subterráneo de Canfranc, Spain
- 11/8/2017 Solar and terrestrial neutrinos with Borexino, Mini-Workshop on Neutrino Physics, Universidad Nacional Autonoma de Mexico (UNAM)
- 5/2/2017 Weighing neutrinos (and the Universe) with noble liquid time projection chambers, Physics colloquium, University of Washington
- 5/1/2017 The challenges of the nEXO TPC, CENPA seminar, University of Washington

- 1/19/2017 Searching for neutrino less double beta decay with EXO-200 and nEXO, Physics seminar, Pacific Northwest National Laboratory
- 6/9/2016 The present and future of the DarkSide program: DS-50 and DS-20k, ECAP seminar, Erlangen, Germany
- 4/5/2016 The present and future of the DarkSide program: DS-50 and DS-20k, WIDG Physics seminar, Yale University
- 10/14/2015 Searching for neutrino-less double beta decay with the EXO-200 experiment, Physics colloquium, Rensselaer Polytechnic Institute
- 5/5/2015 The EXO-200 experiment: present and future, RED seminar, Livermore National Laboratory
- 3/27/2015 Present and future of solar neutrino physics with Borexino, Physics seminar, University of Wisconsin, Madison
- 11/20/2014 Present and future of solar neutrino physics with Borexino, Physics seminar, Drexel University, Philadelphia
- 2/28/2014 A needle in a (cold) haystack: Searching for neutrino-less double beta decay with the Enriched Xenon Observatory, Physics colloquium, University of Kentucky, Lexington
- 1/31/2014 A needle in a (cold) haystack: Searching for neutrino-less double beta decay with the Enriched Xenon Observatory, Physics colloquium, UMass Amherst
- 6/18/2013 Search for Neutrino-less Double Beta Decay with EXO, Physics seminar, IFIC, Valencia
- 9/27/2012 Neutrino mass: so tiny yet so intriguing, Physics colloquium, Amherst College
- 3/22/2012 First data from the EXO-200 double beta decay experiment, seminar, Laboratori Nazionali del Gran Sasso, Italy
- 10/17/2011 Swoooosh goes the neutrino (the OPERA results and super-luminal neutrinos), Physics brown bag seminar, UMass Amherst
- 10/4/2011 First physics from the EXO-200 double beta decay experiment, LNS seminar, MIT
- 9/20/2011 Two nu's is good news (but no nu's would be priceless!), Physics brown bag seminar, UMass Amherst
- 3/4/2011 Borexino — a low energy neutrino telescope to probe the inner workings of the sun, the stars and the earth, Physics seminar, Indiana University
- 4/28/2010 Noble endeavors measuring neutrino mass and searching for dark matter with the EXO and Darkside experiments, Physics colloquium, UMass Amherst
- 4/22/2010 The EXO double beta decay experiment, Physics seminar, Yale University
- 2/24/2010 Solar Neutrino Science with Borexino, Physics seminar, University of Maryland, College Park
- 12/8/2009 A walk on the Dark Side, Physics brown bag seminar, UMass Amherst
- 2/17/2009 Detecting Double Beta Decay past, present and future: lessons in neutrino physics, Physics brown bag seminar, UMass Amherst
- 12/10/2008 Flat cables for EXO-200, AIS seminar, SLAC

Departmental Service (UMass Physics)

9/2016—present	Honors Program, Director
1/2016—present	Undergraduate Advisor
1/2016—present	Undergraduate Curriculum Committee
1/2019—5/2019	Undergraduate Laboratory Curriculum Review Group
1/2016—present	Undergraduate Awards Committee
1/2020—present	Graduate Curriculum Committee
9/2017—10/2019	Graduate Admissions Committee
9/2010—8/2013	
2013—2014	Graduate Qualifying Exam Committee
2012—2014	Graduate Advisor
9/2018—8/2021	Personnel Sub-Committee (Chair 1/2020-8/2021)
9/2010—8/2011	
1/2009—present	Personnel Committee (default faculty member)
8/2019—present	Climate Committee, co-Chair
2/2019—present	Teaching Evaluation Working Group
6/2016—5/2018	Bylaws Committee
2017—2018	Hiring Committee (Gluckstern Chair)
2016—2017	Hiring Committee, Chair (Particle/Nuclear Experiment)
2016—2017	Hiring Committee (Nuclear Theory)
2016—2017	AQAD Committee
2014—2015	Particle/Nuclear Physics Planning Group, co-Chair
Fall 2014	Particle Physics Seminar, co-Organizer
1/2016—9/2019	Machine Shop Committee
9/2013—12/2014	
9/2013—5/2014	Publicity Committee, Chair

University Service

8/2019—present	College of Natural Science Climate Advisory Committee
9/2009—5/2012	Chancellor's Junior Faculty Fellow

Funding

9/1/2021—8/31/2024	NSF PHY-2111213	\$725,000	PI: Andrea Pocar nEXO: a Search for Neutrino-less Double Beta Decay with a Tonne-Scale Enriched Xenon Time Projection Chamber
8/1/2018—7/31/2021	NSF PHY-1821085	\$91,596	PI: Andrea Pocar Collaborative Research: Solar Neutrino Science with Borexino: the quest for CNO neutrinos (Lead PI: Frank Calaprice, Princeton U)
8/1/2018—7/31/2021	NSF PHY-1812245	\$750,000	PI: Andrea Pocar A Search for Neutrino-less Double Beta Decay with nEXO
8/1/2016—7/31/2019	NSF PHY-1606912	\$285,000	PI: Andrea Pocar A Search for Weakly-Interacting Particle Dark Matter with DarkSide
8/1/2015—7/31/2019	NSF PHY-1506051	\$655,000	PI: Andrea Pocar A Search for Neutrino-less Double Beta Decay and Lepton Number Violation with the nEXO Experiment
8/01/2012—7/31/2016	NSF PHY-1211308	\$576,000	PI: A. Pocar; co-PI: L. Cadonati Particle astrophysics with neutrinos and weakly interacting dark matter: Borexino and DarkSide
6/14/2012—6/13/2016	NSF PHY-1209907	\$609,000	PI: Andrea Pocar Neutrino-less double beta decay with EXO-200 and EXO
11/9/2015—5/31/2016	SLAC RFP No. 260632	\$19,528	PI: Andrea Pocar Design of a novel xenon purity monitor for the nEXO experiment at SLAC (SLAC PIs: P. Rowson and G. Gratta)
9/1/2014—1/10/2015	FNAL PO No. 618961	\$19,687	PI: Andrea Pocar Demonstration of performance of purified argon in Fermilab Proton Assembly Bldg for Darkside experiment (FNAL PI: Stephen Pordes)
1/13/2014—1/12/2015	FNAL PO No. 616124	\$48,486	PI: Andrea Pocar Fixed Price Proposal for Services of Gary Forster to Work on DarkSide-50 Experiment (FNAL PI: Stephen Pordes)
9/15/2012—09/14/2014	NSF PHY-1242623	\$60,000	PI: Andrea Pocar Collaborative Research: R&D Toward DarkSide-G2, a Second Generation Direct Search for Dark Matter (Lead PI: Cristiano Galbiati, Princeton U)
10/1/2010—9/30/2012	NSF PHY-1004082	\$115,134	PI: A. Pocar; co-PI: L. Cadonati Collaborative Research: A Depleted Argon Detector for a Dark Matter Search (Lead PI: Cristiano Galbiati, Princeton U)
10/1/2009—9/30/2012	NSF PHY-0902140	\$316,390	PI: A. Pocar; co-PI: L. Cadonati Solar Neutrino Science with Borexino
6/15/2009—5/31/2013	NSF PHY-0855605	\$510,000	PI: A. Pocar; co-PI: K. Kumar Neutrino-less double beta decay with EXO-200 and EXO

Mentoring Activity

Postdoctoral Researchers

4	12/2020—present	Wesley Gillis	
3	11/2017—12/2020	Michal Tarka	Research Associate since 11/2018
2	9/2010—2/2013	John David Wright	Adjunct postdoc
1	7/2009—7/2014	Tim Daniels	Current position: Assistant Professor University of North Carolina, Wilmington

Graduate Students

13	11/2021—present	Sili Wu	nEXO
12	11/2021—present	Edryd Van Bruggen	nEXO
11	1/2019—present	Seth Thibado	EXO-200 and nEXO
10	6/2018—6/2021	Matthew Downing	DarkSide (DS-50 and DS-20k) Worked in my EXO group performing studying radon-borne backgrounds. Master's degree, UMass Amherst, August 2021. Now: private sector
9	6/2014—5/2021	Sara Feyzbakhsh	EXO-200 and nEXO Worked in my EXO group performing studying radon-borne backgrounds. Master's degree, UMass Amherst, August 2021.
8	1/2020—7/2020	Winnie Wang	nEXO Master's student, Worked on light collection studies for nEXO with Chroma software; Now: PhD student at U. Wisconsin.
7	10/2019—6/2020	Emmanuele Picciau	DarkSide ACFI visiting PhD student from Cagliari University, Italy
6	6/2014—9/2018	Alissa Monte	DarkSide (DS-50 and DS-20k) PhD dissertation: Alpha radiation studies and related backgrounds in the DarkSide-50 detector, UMass Amherst, September 2018 Now: postdoctoral researcher at UCSB
5	12/2011—9/2016	Sereres Johnston	EXO-200 PhD dissertation: A Search for Double Beta Decay of Xenon to Excited States of Barium with EXO-200, UMass Amherst, July 2016 Now: private sector after postdoctoral position at Argonne
4	9/2015—5/2016	Michael Nieslony	Borexino (SOX) Master's exchange student from KIT Karlsruhe, Germany Now: PhD physics student in Mainz, Germany
3	9/2013—8/2015	Tom Alexander	DarkSide (DS-10, DS-50, Scene) Master's thesis: Validation of argon from underground sources for use in the DarkSide-50 detector, UMass Amherst, September 2015; Now: research staff at PNNL
2	6/2010—5/2014	Keith Otis	Borexino PhD dissertation: Direct measurement of the pp solar neutrino interaction rate in Borexino, UMass Amherst, May 2014 Now: employed in private sector

1	5/2009—12/2010	Jessica Cook	EXO-200 Worked in my EXO group performing scintillation light simulations before moving on to high energy theory at UMass Amherst Now: assistant professor of physics (Eastern Connecticut U.)
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Graduate Student Committees

16	9/2021—present	Pratyush Patel	UMass Amherst, Physics
15	9/2020—present	Natalie de Nigris	UMass Amherst, Astronomy
14	8/2020—present	Sarah Betti	UMass Amherst & Amherst Coll., Astronomy
13	5/2020—present	Alyssa Sokol	UMass Amherst, Astronomy
12	5/2020—present	Guanghui Zhou	UMass Amherst, Physics
11	9/2018—12/2021	Chris Nedlik	UMass Amherst, Physics
10	5/2020—11/2021	Gwendolyn Bracker	UMass Amherst, Mech. & Ind. Engineering
9	2/2021	Marco D'Andrea, Fabio Jacob, Michelangelo Pari, Luigi Pertoldi	U. of Padova, Italy, Physics
8	9/2017—12/2019	Mitchell Hughes	U. of Alabama, Tuscaloosa, Physics
7	6/2019	Marco Marcante	U. of Trento, Italy, Physics
6	1/2014—9/2018	Yi-Hsuan (Cindy) Lin	Drexel U., Physics
5	1/2014—7/2017	Andrew Battisti	UMass Amherst, Astronomy
4	2/2014—8/2015	Zhankui Lu	UMass Amherst, Astronomy
3	2/2014—5/2014	Jon Wexler	UMass Amherst, Physics
2	1/2012—2/2013	German Colon	UMass Amherst, Physics
1	6/2009—9/2012	Satya Mohapatra	UMass Amherst, Physics

Pre-Doctoral Research Assistants

Note — The students listed below joined my group full-time with an undergraduate degree in physics (or similar) and worked as they prepared their applications to graduate school

11	1/2022—8/2022	Reed Cohen	LXe lab Undergraduate school of origin: Hampshire College
10	5/2021—12/2021	Cole Mirabito	LXe lab Undergraduate school of origin: University of Massachusetts, Amherst
9	1/2021—8/2021	Rishika Kumar	LXe lab Undergraduate school of origin: University of Massachusetts, Amherst Next: physics graduate student at Boston College
8	8/2019—12/2020	Michelle Wellman	LXe lab Undergraduate school of origin: Mount Holyoke College
7	6/2018—5/2019	Mufid Alfaris	nEXO Undergraduate school of origin: University of Massachusetts, Amherst Next: Engineer at Energetiq
6	8/2017—8/2018	Dan Kodroff	nEXO Undergraduate school of origin: Penn State University Next: physics graduate student at Penn State University

5	1/2015—5/2016	Jacob Rose	LXe lab Undergraduate school of origin: University of Massachusetts, Amherst
4	5/2014—5/2016	Jacopo Dalmasson	nEXO (at SLAC after 10/2015) Undergraduate school of origin: University of Milano-Bicocca, Italy Next: graduate student at Stanford University
3	1/2015—8/2015	Ed Lipchus	SiPM testing Undergraduate school of origin: Hampshire College
2	2014—2015	Josh Bonatt	EXO-200 Hands-on operator at the WIPP site, Carlsbad, NM. Undergraduate school of origin: University of Massachusetts, Amherst Next: Master's degree in physics at Queen's University (Canada)
2	5/2014—10/2015	Gary Forster	DarkSide Argon extraction (at Cortez, CO) and purification (at Fermilab) Undergraduate school of origin: University of Massachusetts, Amherst Next: math teacher at Pioneer Valley Chinese Immersion Charter School in Hadley, FTL Labs Amherst
1	9/2011—5/2012	Amanda Lund	Borexino and DarkSide (at LNGS) Undergraduate school of origin: University of Massachusetts, Amherst

Undergraduate Students

60	1/2021—present	Arunendro Dutta	nEXO	Graduation date: 5/2024
59	2/2020—present	Thomas Pinto Franco	nEXO	Graduation date: 5/2022 Projects: LabView programming, SiPM data analysis, LXe lab work
58	5/2019—5/2021	Cole Mirabito	nEXO	Senior thesis: Characterization of ionization charge tiles for nEXO, UMass Amherst, May 2021
57	5/2019—9/2021	Reed Cohen (Hampshire College)	nEXO	Projects: Database for SiPM data; SiPM characterization data analysis Senior thesis: MPPC Testing for the nEXO Experiment, Hampshire College, September 2021
56	4/2019—12/2020	Rishika Kumar	nEXO	Project: Chroma optical simulations
55	2/2018—5/2021	Jack Bolster	nEXO	Projects: LabVIEW control system for LXe test setup Senior thesis: Characterization of SiPM detectors in liquid xenon, UMass Amherst, May 2021
54	5/2019—3/2020	William Kotlinski	nEXO	Project: LXe operations, SolidWorks modeling
53	1/2019—5/2019	Aaron Lage	nEXO	Project: Laboratory computing infrastructure
52	2/2018—5/2019	Maija Orlovski Nagels	Xenon lab	
51	6/2018—12/2018	Andrew Palmer	Borexino	Project: Borexino data validation.
50	9/2016—5/2019	John Blatchford	nEXO	Senior thesis: Characterization of Silicon Photomultipliers for the nEXO

Neutrinoless Double Beta Decay Experiment, UMass Amherst, May 2019

49	9/2016—12/2018	Shashank Jayakumar	DarkSide Project: DS-20k simulations
48	9/2016—8/2018	Anwasha Saha	Xenon lab Projects: i) Optical Simulations of SiPMs in a liquid xenon system using Chroma; ii) Characterization of a mechanical cryocooler
47	Summers 2017/18	Raj Kumar (Brown University)	Xenon lab Project: Data analysis for SiPM tests
46	2/2016—8/2018	Ian Murphy	Xenon lab Projects: Building a Muon-tagging Telescope; SiPM cryogenic tests in vacuum
45	1/2017—5/2018	Matt Downing	EXO-200 and nEXO Senior thesis: Studying the presence of krypton-85 in the DarkSide detector, UMass Amherst, May 2018
44	1/2017—5/2018	Mufid Alfaris	nEXO Project: nEXO cathode prototyping
43	9/2016—12/2017	Sonya Leaf	DarkSide Project: DS-50 data analysis
42	1/2016—12/2017	Matt Burke	Xenon lab Project: Temperature characterization of SiPM test station
41	9/2015—5/2017	Kaylee Spitaels	nEXO Senior project: Prototyping a cathode for nEXO
40	9/2014—5/2017	Charles Mark Lewis	nEXO Senior project: Xenon condenser and SiPM testing, UMass Amherst, May 2017
39	1/2015—12/2016	Jackson Gibney	nEXO Project: LabVIEW control system for LXe test setup
38	1/2015—10/2016	Jeffrey Ames	nEXO Project: In-vacuum cryogenic test setup for Si photosensors
	6/2015—5/2016	Olivia Comeau	DarkSide Project: Analysis of data from a radon detector for air
37	9/2014—5/2016	Eddie Gelberg	nEXO Senior thesis: Characterization of silicon photomultipliers for use in the next Enriched Xenon Observatory, UMass Amherst, May 2017
36	9/2015—5/2016	Mitch Negus	nEXO Senior thesis: Diagnostically simulating radon progeny at the nEXO cathode, UMass Amherst, May 2016
35	9/2015—5/2016	Beryl Bell (Hampshire College)	EXO-200 Senior thesis: Development of Algorithm for Identifying Particle Origin of Charge Deposits From EXO-200 Experiment via Compton Scatter Analysis of Clusters, Hampshire College, May 2016
34	1/2015—5/2016	Trey Nasser	LXe lab Project: Slow-control programming with LabVIEW and maintenance
33	9/2014—12/2015	Javier King	EXO-200 Project: Geant4 simulations of ancestor particles

32	2/2015—8/2015	Else Schlerman (Wellesley College)	DarkSide
		Project: Study of alpha backgrounds in DS-50	
31	9/2014—5/2015	Molly Kelly-Gorham	nEXO
		Project: Characterization of Photosensors for Use in Liquid Xenon	
30	9/2013—5/2015	Dan Shy	nEXO
		Senior project: Construction of a Xenon Cryostat and Purification System	
29	9/2013—5/2015	Adam Zec	DarkSide
		Senior Project: Understanding Backgrounds in the DarkSide-50 Detector	
28	9/2013—5/2015	Owen Mannion	Simulations
		Senior project: Ab-initio simulations of neutron propagation	
27	6/2014—12/2014	Ed Lipchus	Photosensor testing
		Senior thesis: Testing silicon photosensors at LXe temperature, Hampshire College, December 2014	
26	1/2014—12/2014	Raymond Elias-Cartwright	Xenon lab
		Project: tests of APDs at cryogenic temperature	
25	9/2013—12/2014	Chris Bert	Xenon lab
		Project: Instrumentation slow control	
24	6/2013—12/2014	Jasmine Abdollahi	EXO-200
		Project: EXO-200 deradonator	
23	9/2012—5/2014	Arthur Kurlej	DarkSide
		Project: DS-50 data validation and analysis	
22	9/2012—5/2014	Gary Forster	DarkSide/EXO-200
		Projects: DarkSide radio-assays; EXO-200 deradonator	
21	9/2011—5/2014	Kirsten Randle	DarkSide/EXO-200
		Projects: DS-50 analysis; EXO-200 deradonator	
20	10/2010—5/2013	Kelly Malone	EXO-200
		Senior project: Development of the slow control system for a radon filter for the EXO-200 experiment, UMass Amherst, May 2013	
19	9/2011—5/2013	Cameron MacKeen	EXO-200
		Senior thesis: Cryogenic tests of LAAPDs in vacuum, UMass Amherst, May 2013	
18	9/2011—5/2013	Mark Lodato	EXO-200
		Senior project: Design of a xenon liquefaction system	
17	9/2011—5/2013	Monica Harrelson	EXO
		Project: Investigating heating strategies for ion release	
16	9/2012—5/2013	John Howard	Borexino
		Senior project: Study of multi-variate analysis techniques for background discrimination	
15	9/2012—5/2013	Brian Harvie	Xenon lab
		Project: Hardware selection for EXO-200 deradonator	
14	1/2012—5/2013	Monica Harrelson	EXO
		Project: Tests of heating strategies for ion release from surfaces	
13	1/2012—5/2012	Josh Bonatt	Xenon lab
		Project: Data analysis of proton-irradiated xenon	

12	9/2010—5/2012	Alex Nemtzow	DarkSide	Senior thesis: DS-10 detector and DS-50 data analysis, UMass Amherst, May 2012
11	9/2010—5/2012	Chris Dunay	Xenon lab	Project: Xenon flasher for scintillation studies
10	Summer 2011	Gavin Myers (Bard College)	EXO	Project: Design of an LAAPD holder for Ba-tagging studies
9	9/2010—5/2011	Tyler DeMarco	Instrumentation	Senior project: Design of Radon Emanation Chamber for Low Background Particle Physics, UMass Amherst, May 2012
8	9/2009—5/2011	Amanda Lund	Borexino	Senior thesis: Study of Borexino radon-related backgrounds
7	9/2009—5/2011	Keith Fratus	Borexino	Senior thesis: Cosmic muon tagging via multi-variate analysis
6	9/2009—5/2011	John Quirk	Borexino	Senior thesis: Multivariate carbon-11 background tagging, UMass Amherst, May 2011
5	9/2009—5/2011	Chris Sterpka	EXO-200	Project: EXO-200 APD light map programming
4	9/2009—5/2011	Andy Dowd	Xenon lab	Projects: Design of an educational spark chamber
3	9/2009—5/2011	Brandon Kyle Schmoll	EXO	Senior thesis: Xenon lab initial arrangement
2	Summer 2008	Tianlu Yuan	EXO-200	Senior project: Neutron backgrounds in EXO-200
1	2004	Tom Bender (Princeton)	EXO	Senior project: Cosmogenic background in xenon