

# Andrea Pietro Pocar

PSB W110 — Physics Department and  
Amherst Center for Fundamental Interactions  
University of Massachusetts, Amherst  
+1 413-545-2011 — pocar@umass.edu

---

## Education

- 1998—2003 **Ph.D.** — Physics, Princeton University, Princeton NJ, USA  
1990—1996 **Laurea** — Physics, University of Milan, Italy, 110/110 cum laude  
1985—1990 **Maturità** — Liceo Scientifico “R. Donatelli”, Milan, Italy, 60/60 cum laude
- Ph.D. thesis Low background techniques and experimental challenges for Borexino and its nylon vessels (advisor: Frank Calaprice, Princeton University)
- Laurea thesis Design and realization of a laser system for testing and developing pixel detectors for the ATLAS experiment at CERN (advisor: Laura Perasso, University of Milan, Italy)

---

## Professional Appointments

- 9/2019—present **Professor** — Department of Physics, University of Massachusetts, Amherst, MA, USA
- 1/2017—present **Associate Director** — Amherst Center for Fundamental Interactions (ACFI), Department of Physics, University of Massachusetts, Amherst, MA, USA
- 1/2015—present **Visiting Scientist** — Lawrence Livermore National Laboratory (LLNL), Livermore, CA, USA
- 1/2015—8/2019 **Associate Professor** — Department of Physics, University of Massachusetts, Amherst, MA, USA
- 9/2015—12/2015 **Visiting Scholar** — Department of Physics, Princeton University, Princeton, NJ, USA
- 1/2009—12/2014 **Assistant Professor** — Department of Physics, University of Massachusetts, Amherst, MA, USA

---

## Postdoctoral

- 10/2004—12/2008 **Postdoctoral Researcher** — Department of Physics, Stanford University, Stanford, CA, USA (Enriched Xenon Observatory (EXO) group, Giorgio Gratta)
- 9/2003—9/2004 **Postdoctoral Researcher** — Department of Physics, Princeton University, Princeton NJ, USA (Borexino group, Frank Calaprice)

---

## Predocctoral

- 1/2001—6/2001 **Teaching Assistant** — Department of Physics, Princeton University, Princeton NJ, USA
- 6/1998—12/2003 **Research Assistant** — Department of Physics, Princeton University, Princeton NJ, USA
- 8/1997—5/1998 **Research Assistant** — SCIPP, Department of Physics, University of California, Santa Cruz, CA, USA (GLAST/FermiLAT group, Hartmut Sadrozinski)
- 6/1997—7/1997 **Research Assistant** — Physics Division, Lawrence Berkeley National Laboratory, Berkeley, CA, USA (ATLAS pixels group, Kevin Einsweiler)

---

## Other

- 6/1995—5/1996 **Civil servant** — Caritas Ambrosiana, Milan, Italy  
Laboratorio Arcobaleno, Associazione Sviluppo e Promozione, 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), Member
- 1994—1997 Italian Physical Society (SIF), Member

---

## Professional Service

- 4/2020—present APS-DPF Snowmass 2021, Rare Processes and Precision Measurements Frontier, Baryon and Lepton Number Violation Topical co-Convener
- 9/2020—present Graduate Instrumentation Research Award (GIRA) selection committee
- 2/2020—present Experiment Advisory Committee (EAC), SNOLAB
- 10/2020—9/2021 BLV 2021 International Workshop, Brussels, Belgium, 6-10 September 2021, International Science Committee
- Dec. 2020 ACFI-Snowmass Workshop on “Beyond the tonne-scale 0 $\nu$  Double Beta Decay”, Dec 9-11, University of Massachusetts, Amherst, MA, USA (virtual)
- July 2020 BLV circa 2020 International Workshop, July 6-8, 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”, Organizing Committee
- 10/31—11/3/2017 ACFI School on the “Physics Double Beta Decay”, Organizing Committee
- 2015 BLV 2015 International Workshop, Amherst, MA, USA: Science Advisory and Local Organizing Committee
- 2009—present Panel and Project reviewer: DoE, NSF, INFN  
Ad-hoc reviewer:  
DoE, DoE-SBIR, NSF, NSERC (Canada), SNF (Switzerland), FSC (Portugal)  
Journal reviewer: Particle Data Group, JINST, NIMA, AJP, IEEE/NSS, EPJC, Frontiers in Phys., Arab. J. Chem.

---

## Honors and Awards

- 2015 Business Insider “50 groundbreaking scientists who are changing the world”
- 2014 PhysicsWorld Top Ten Breakthroughs of the Year to the Borexino Experiment (for the detection of  $pp$  solar neutrinos)

---

## Outreach

- 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  
9/2017—present
- nEXO and EXO-200 Collaboration Boards\*, UMass Representative
  - nEXO Collaboration Board, Chair

*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.*
  - nEXO Executive Council, Member

*Main advisory body for the Spokesperson, currently composed of eight members. Membership automatic with Board membership*
- 2009—2014
- EXO 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.*
- 2012—2014
- EXO Advisory Board, Member

*A six-person, rather informal advisory body for the Spokesperson (replaced by the nEXO Executive Council in 2014)*
- 2009—2014
- EXO Speakers Coordinator

*Person in charge of requesting talks and posters at conferences and workshops on behalf of the collaboration and identifying available speakers*
- 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 Manager (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 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—present

### Commissioning and operations

- *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—present
- 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,  $\alpha$ -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

- F20 Nuclear and Particle Physics, PHY556/714 (UMass)
- S20, S21 Graduate Electro-Magnetism, PHY606 (UMass)
- S20 Honors Discovery 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

An online list of publications is found at <http://inspirehep.net>

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-46 nEXO collaboration, T. Stiegler et al., Event Reconstruction in a Liquid Xenon Time Projection Chamber with an Optically-Open Field Cage, submitted to Nucl. Instrum. Meth A; arXiv:2009.10231
- =&E-45 EXO-200 collaboration, G. Anton et al., Measurement of the Spectral Shape of the  $\beta$ -decay of  $^{137}\text{Xe}$  to the Ground State of  $^{137}\text{Cs}$  in EXO-200 and Comparison with Theory, Phys. Rev. Lett. 124, 232502 (2020); arXiv:2002.00108
- E-44 nEXO collaboration, P. Lv et al., Reflectance of Silicon Photomultipliers at Vacuum Ultraviolet Wavelengths, IEEE TNS doi: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); 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  $^{134}\text{Xe}$  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  $^{136}\text{Xe}$  to the  $0_1^+$  excited state of  $^{136}\text{Ba}$  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<sup>+</sup> 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  $^{136}\text{Xe}$  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  $2\nu\beta\beta$  half-life of  $^{136}\text{Xe}$  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  $^{136}\text{Xe}$  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-24 DarkSide-20k collaboration, P. Agnes et al., Sensitivity of future liquid argon dark matter search experiments to core-collapse supernova neutrinos, submitted to JCAP; arXiv:2011.07819
- 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, submitted to *Eur. Phys. J. C*; arXiv:2004.02024
- D-22 DarkSide collaboration, P. Agnes et al., Effective field theory interactions for liquid argon target in DarkSide-50 experiment, *Phys. Rev. D* 101, 062002 (2020)
- \*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  $^{218}\text{Po}$  produced in  $^{222}\text{Rn}$  decays in liquid argon, *J. Inst.* 14, P11018 (2019); arXiv:1907.09332
- &=D-19 DarkSide collaboration, P. Agnes et al., DarkSide-50 532-day WIMP dark matter search with low-radioactivity argon, *Phys. Rev. D* 98, 102006 (2018); arXiv:1802.07198

- D-18 DarkSide collaboration, P. Agnes et al., Constraints on sub-GeV dark matter-electron scattering from the DarkSide-50 experiment, *Phys. Rev. Lett.* 121, 111303 (2018); arXiv:1802.06998
- &D-17 DarkSide collaboration, P. Agnes et al., Low-mass dark matter search with the DarkSide-50 experiment, *Phys. Rev. Lett.* 121, 081307 (2018); arXiv:1802.06994
- &D-16 DarkSide collaboration, P. Agnes et al., Electroluminescence pulse shape and electron diffusion in liquid argon measured in a dual-phase TPC, *Nucl. Instr. Meth. A* 904, 23 (2018); arXiv:1802.01427
- \*D-15 DarkSide collaboration, C.E. Aalseth et al., DarkSide-20: A 20 tonne two-phase LAr TPC for direct dark matter detection at LNGS, *Eur. Phys. J. Plus* 133, 131 (2018); arXiv:1707.08145
- D-14 DarkSide collaboration, P. Agnes et al., The electronics, trigger, and data acquisition system for the liquid argon time projection chamber of the DarkSide-50 Search for dark matter, *J. Inst.* 12, P12011 (2017); arXiv:1707.09889
- D-13 DarkSide collaboration, P. Agnes et al., CALIS - a CALibration insertion system for the DarkSide-50 dark matter search experiment, *J. Inst.* 12, T12004 (2017); arXiv:1611.02750
- D-12 DarkSide collaboration, P. Agnes et al., Simulation of argon response and light detection in the DarkSide-50 dual phase TPC, *J. Inst.* 12, P10015 (2017); arXiv:1707.05630
- D-11 DarkSide collaboration, C.E. Aalseth et al., Cryogenic characterization of FBK RGB-HD SiPMs, *J. Inst.* 12, P09030 (2017); arXiv:1705.07028
- D-10 DarkSide collaboration, P. Agnes et al., Effect of low electric fields on alpha scintillation light yield in liquid argon, *J. Inst.* 12, P01021 (2017); arXiv:1611.00241
- D-9 DarkSide collaboration, P. Agnes et al., The Electronics and data acquisition system for the DarkSide-50 veto detectors, *J. Inst.* 11, P12007 (2016); arXiv:1606.03316
- &D-8 D. Franco et al., Solar neutrino detection in a large volume double-phase liquid argon experiment, *JCAP* 08, 017 (2016); arXiv:1510.04196
- D-7 DarkSide collaboration, P. Agnes et al., The veto system of the DarkSide-50 experiment, *JINST* 11, P03016 (2016); arXiv:1510.07896
- &D-6 DarkSide collaboration, P. Agnes et al., Results from the first use of low radioactivity argon in a dark matter search, *Phys. Rev. C* 93, 081101(R) (2016); arXiv:1510.00702
- &D-5 DarkSide collaboration, P. Agnes et al., The DarkSide Multiton Detector for the Direct Dark Matter Search, *Adv. High En. Phys.*, 2015, 541362 (2015)
- &D-4 DarkSide collaboration, P. Agnes et al., First Results from the DarkSide-50 Dark Matter Experiment at Laboratori Nazionali del Gran Sasso, *Phys. Lett. B* 743, 456 (2015); arXiv:1410.0653
- &D-3 DarkSide collaboration T. Alexander et al., Light Yield in DarkSide-10: a Prototype Two-phase Liquid Argon TPC for Dark Matter Searches, *Astropart. Phys.* 49, 44 (2013); arXiv:1204.6218
- D-2 H.O. Back et al., First Large Scale Production of Low Radioactivity Argon from Underground Sources, arXiv:1204.6024
- =D-1 D. Acosta-Kane et al., Discovery of underground argon with low level of radioactive  $^{39}\text{Ar}$  and possible applications to WIMP dark matter detectors, *Nucl. Instr. Meth. A* 587, 46 (2008)

---

## Borexino and related papers

- \*&B-55 Borexino collaboration, M. Agostini et al., Experimental evidence of neutrinos produced in the CNO fusion cycle in the Sun, *Nature* 587, 577 (2020); arXiv:2006.15115

- \*B-54 Borexino collaboration, M. Agostini et al., Sensitivity to neutrinos from the solar CNO cycle in Borexino, *Eur. Phys. J. C* 80, 1091 (2020); arXiv:2005.12829
- \*=B-53 Borexino collaboration, M. Agostini et al., Improved measurements of  $^8\text{B}$  solar neutrinos with 1.5 kt·y of Borexino exposure; *Phys. Rev D* 101, 062001 (2020); arXiv:1709.00756
- \*B-52 Borexino collaboration, M. Agostini et al., Search for low-energy neutrinos from astrophysical sources with Borexino, *Astropart. Phys.* 125102509 (2021); arXiv:1909.02422
- B-51 Borexino collaboration, M. Agostini et al., Comprehensive geoneutrino analysis with Borexino, *Phys. Rev D* 101, 012009 (2019); arXiv:1909.02257
- \*B-50 Borexino collaboration, M. Agarwalla et al., Constraints on Non-Standard Neutrino Interactions from Borexino Phase-II, submitted to JHEP; arXiv:1905.03512
- &B-49 Borexino collaboration, M. Agostini et al., Simultaneous Precision Spectroscopy of pp,  $^7\text{Be}$ , and pep Solar Neutrinos with Borexino Phase-II, to appear in *Phys. Rev. D*
- \*=B-48 Borexino collaboration, M. Agostini et al., Modulations of the cosmic muon signal in ten years of Borexino data, *JCAP* 02, 46 (2019); arXiv:1808.04207
- =B-47 Borexino collaboration, M. Agostini et al., Comprehensive measurement of pp-chain solar neutrinos, *Nature* 562, 496 (2018); arXiv:1707.09279
- =B-46 Borexino collaboration, M. Agostini et al., The Monte Carlo simulation of the Borexino detector, *Astropart. Phys.* 97, 136 (2018); arXiv:1704.02291
- B-45 Borexino collaboration, M. Agostini et al., Limiting neutrino magnetic moments with Borexino Phase-II solar neutrino data, *Phys. Rev. D* 96, 091103(R) (2017); arXiv:1707.09355
- B-44 Borexino collaboration, M. Agostini et al., A search for low-energy neutrinos correlated with gravitational wave events GW150914, GW151226 and GW170104 with the Borexino detector, *Astrophys. J.* 850, 21 (2017); arXiv:1701.07970
- =B-43 Borexino collaboration, M. Agostini et al., Seasonal modulation of the  $^7\text{Be}$  solar neutrino rate in Borexino, *Astropart. Phys.* 92, 21 (2017); arXiv:1701.07970
- B-42 Borexino collaboration, M. Agostini et al., Borexino's search for low-energy neutrino and antineutrino signals correlated with gamma-ray bursts, *Astropart. Phys.* 86, 11 (2017); arXiv:1607.05649
- =B-41 Borexino collaboration, M. Agostini et al., A test of electric charge conservation with Borexino, *Phys. Rev. Lett.* 115, 231802 (2015); arXiv:1509.01223
- =B-40 Borexino collaboration, M. Agostini et al., Spectroscopy of geo-neutrinos from 2056 days of Borexino data, *Phys. Rev. D* 92, 031101(R) (2015); arXiv:1508.04610
- +&B-39 Borexino collaboration, G. Bellini et al., Neutrinos from the primary proton-proton fusion in the Sun, *Nature* 512, 383-386 (2014)
- =B-38 Borexino collaboration, G. Bellini et al., Final results of Borexino phase-I on low energy solar neutrino spectroscopy, *Phys. Rev. D* 89, 112007 (2014); arXiv:1308.0443
- =\*&B-37 L. Cadonati et al., The nylon scintillator containment vessels for the Borexino solar neutrino experiment, *Int. J. Mod. Phys. A* 29(16), 1442004 (2014)
- =B-36 Borexino collaboration, G. Bellini et al., New limits on heavy sterile neutrino mixing in  $^8\text{B}$ -decay obtained with the Borexino detector, *Phys. Rev. D* 88, 072010 (2013)
- B-35 Borexino collaboration, G. Bellini et al., SOX: Short distance neutrino Oscillations with Borexino, *JHEP* 8, 38 (2013); arXiv:1304.7721

- =&B-34 Borexino collaboration, G. Bellini et al., Cosmogenic backgrounds in Borexino at 3800 m water-equivalent depth, JCAP 8, 49 (2013); arXiv:1304.7381
- =B-33 Borexino collaboration, G. Bellini et al., Measurement of geo-neutrinos from 1353 days of Borexino, Phys. Lett. B722, 295 (2013); arXiv:1303.2571
- B-32 Borexino collaboration, G. Bellini et al., Lifetimes of  $^{214}\text{Po}$  and  $^{212}\text{Po}$  measured with Counting Test Facility at Gran Sasso National Laboratory, Eur. Phys. J. A49, 92 (2013); arXiv:1212.1332
- B-31 Borexino collaboration, H. Back et al., Borexino calibrations: hardware, methods, and results, J. Inst. 7, P10018 (2012); arXiv:1207.4816
- B-30 Borexino collaboration, P. Alvarez Sanchez et al., Measurement of CNGS muon neutrino speed with Borexino, Phys. Lett. B 716, 401 (2012); arXiv:1207.6860
- 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
- =&B-28 Borexino collaboration, G. Bellini et al. Cosmic-muon flux and annual modulation in Borexino at 3800 m water-equivalent depth, JCAP 05, 015 (2012); arXiv:1202.6403
- \*=&B-27 Borexino collaboration, G. Bellini et al., First evidence of pep solar neutrinos by direct detection in Borexino, Phys. Rev. Lett. 108, 051302 (2012); arXiv:1110.3230
- =B-26 Borexino collaboration, G. Bellini et al., Absence of day-night asymmetry of 862 keV  $^7\text{Be}$  solar neutrino rate in Borexino and MSW oscillation parameters, Phys. Lett. B 707, 22 (2012); arXiv:1104.2150
- =&B-25 Borexino collaboration, G. Bellini et al., Precision measurement of the 0.862 MeV  $^7\text{Be}$  solar neutrino interaction rate in Borexino, Phys. Rev. Lett. 107, 141302 (2011); arXiv:1104.1816
- =&B-24 Borexino collaboration, G. Bellini et al., Muon and cosmogenic neutron detection in Borexino, J. Inst. 6, P05005 (2011); arXiv:1101.3101
- =B-23 Borexino collaboration, G. Bellini et al., Study of solar and other unknown anti-neutrino fluxes with Borexino at LNGS, Phys. Lett. B 696, 191 (2011); arXiv:1010.0029
- =B-22 Borexino collaboration, G. Bellini et al., Measurement of the solar  $^8\text{B}$  neutrino rate with a liquid scintillator target and 3 MeV energy threshold in the Borexino detector, Phys. Rev. D 82, 033004 (2010); arXiv:0808.2868
- =B-21 Borexino collaboration, G. Bellini et al., Observation of geo-neutrinos, Phys. Lett. B 687, 299 (2010); arXiv:1003.0284
- B-20 Borexino collaboration, G. Bellini et al., New experimental limits on the Pauli-forbidden transitions in  $^{12}\text{C}$  nuclei obtained with 485 days of Borexino data, Phys. Rev. C 82, 034317 (2010); arXiv:0911.0548
- &B-19 Borexino collaboration, G. Alimonti et al., The liquid handling systems for the Borexino solar neutrino detector, Nucl. Instr. Meth. A 609, 58 (2009)
- &B-18 J. Benziger et al., The fluid-filling system for the Borexino solar neutrino detector, Nucl. Instr. Meth. A 608, 464 (2009)
- &B-17 Borexino collaboration, G. Alimonti et al., The Borexino detector at the Laboratori Nazionali del Gran Sasso, Nucl. Instr. Meth. A 600, 568 (2009); arXiv:0806.2400
- &B-16 Borexino collaboration, C. Arpesella et al., Direct Measurement of the  $^7\text{Be}$  Solar Neutrino Flux with 192 Days of Borexino Data, Phys. Rev. Lett. 101, 091302 (2008); arXiv:0805.3843
- &B-15 J. Benziger et al., A scintillator purification system for the Borexino solar neutrino experiment, Nucl. Instr. Meth. A 587, 277 (2008); arXiv:0709.1503

- B-14 Borexino collaboration, H. Back et al., Phenylxylylene (PXE): a high-density, high-flashpoint organic liquid scintillator low-energy neutrino experiments, *Nucl. Instr. Meth. A* 585, 48 (2008); arXiv:physics/0408032
- &B-13 Borexino collaboration, C. Arpesella et al., First real time detection of  ${}^7\text{Be}$  solar neutrinos by Borexino, *Phys. Lett. B* 658, 101 (2008); arXiv:0708.2251
- B-12 Borexino collaboration, H. Back et al., Pulse-shape discrimination with the Counting Test Facility, *Nucl. Instr. Meth. A* 584, 98 (2008); arXiv:0705.0239
- \*&B-11 J. Benziger et al., The nylon scintillator containment vessel for the Borexino solar neutrino experiment, *Nucl. Instr. Meth. A* 582, 509 (2007); arXiv:physics/0702162
- =B-10 Borexino collaboration, M. Balata et al., Search for electron antineutrino interactions with the Borexino Counting Test Facility at Gran Sasso, *Eur. Phys. J. C* 47, 12 (2006); arXiv:hep-ph/0602027
- &B-9 Borexino collaboration, H. Back et al., CNO and pep neutrino spectroscopy in Borexino: Measurement of the deep-underground production of cosmogenic  ${}^{11}\text{C}$  in an organic liquid scintillator, *Phys. Rev. C* 74, 045805 (2006); arXiv:hep-ex/0601035
- \*&B-8 C. Galbiati et al., Cosmogenic  ${}^{11}\text{C}$  production and sensitivity of organic scintillator detectors to pep and CNO neutrinos, *Phys. Rev. C* 71, 055805 (2005); arXiv:hep-ph/0411002
- B-7 Borexino collaboration, H. Back et al., New experimental limits on violations of the Pauli exclusion principle obtained with the Borexino Counting Test Facility, *Eur. Phys. J. C* 37, 422 (2004); arXiv:hep-ph/0406252
- B-6 Borexino collaboration, H. Back et al., New Experimental Limits on Heavy Neutrino Mixing in  ${}^8\text{B}$  Decay Obtained with the Borexino Counting Test Facility, *JETP Lett. B* 78, 261 (2003)
- B-5 Borexino collaboration, H. Back et al., New limits on nucleon decays into invisible channels with the BOREXINO counting test facility, *Phys. Lett. B* 563, 23 (2003); arXiv:hep-ex/0302002
- =B-4 Borexino collaboration, H. Back et al., Study of neutrino electromagnetic properties with the prototype of the Borexino detector, *Phys. Lett. B* 563, 35 (2003)
- &B-3 Borexino collaboration, C. Arpesella et al., Measurements of extremely low radioactivity levels in BOREXINO, *Astropart. Phys.* 18, 1 (2002); arXiv:hep-ex/0109031
- =B-2 Borexino collaboration, H. Back et al., Search for electron decay  $e \rightarrow \gamma + \nu$  with prototype Borexino detector, *Phys. Lett. B* 525, 29 (2002)
- &B-1 Borexino collaboration, G. Alimonti et al., Science and technology of Borexino: a real-time detector for low energy solar neutrinos, *Astropart. Phys.* 16, 205 (2002); arXiv:hep-ex/00120301

---

## Other papers

- &O-5 A. Abba et al., The novel Mechanical Ventilator Milano for the COVID-19 pandemic, *IEEE Transactions in Biomedical Engineering*; 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

&O-1 W.B. Atwood et al., Beam test of gamma-ray large area space telescope components, Nucl. Instr. Meth. A 446, 444 (2000); arXiv:physics/9905002

---

## 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.,  $^{11}\text{C}$  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, 9th International Conference on New Frontiers in Physics (ICNFP 2020), 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, virtual
- 7/2020 Neutrinoless Double Beta Decay beyond the ‘Tonne-Scale’, BLV circa 2020 Workshop, July 6-8, 2020, virtual
- 12/2019 Neutrinoless double beta decay with nEXO, CPAD 2019, Instrumentation Frontier Workshop, Dec 8-10, 2019, Madison WI, USA
- 11/2019  $(\alpha, n)$  backgrounds in nEXO, Workshop on  $(\alpha, n)$  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
- 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

- 10/7/2020 Why neutrinos masses, why so little?, SLAC Experimental Seminar, virtual
- 10/7/2019 Why do neutrinos have mass?, MIT-LNS Colloquium, Cambridge MA, USA
- 1/23/2019 Neutrino physics without neutrinos: Probing fundamental symmetries of nature with neutrino-less double beta decay, Physics colloquium, UMass, Amherst MA, USA
- 11/15/2018 Dark matter searches with the DarkSide experiment, IKP seminar, Jülich Forschungszentrum, Jülich, 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, LSC 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), Mexico City, Mexico
- 5/2/2017 Weighing neutrinos (and the Universe) with noble liquid time projection chambers, Physics colloquium, University of Washington, Seattle WA, USA
- 5/1/2017 The challenges of the nEXO TPC, CENPA seminar, University of Washington, Seattle WA, USA
- 1/19/2017 Searching for neutrino less double beta decay with EXO-200 and nEXO, Physics seminar, Pacific Northwest National Laboratory, Richland, WA, USA
- 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, New Haven, CT, USA
- 10/14/2015 Searching for neutrino-less double beta decay with the EXO-200 experiment, Physics colloquium, Rensselaer Polytechnic Institute, Troy, NY, USA
- 5/5/2015 The EXO-200 experiment: present and future, RED seminar, Livermore National Laboratory, Livermore, CA, USA
- 3/27/2015 Present and future of solar neutrino physics with Borexino, Physics seminar, University of Wisconsin, Madison, WI, USA
- 11/20/2014 Present and future of solar neutrino physics with Borexino, Physics seminar, Drexel University, Philadelphia, PA, USA
- 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, KY, USA
- 1/31/2014 A needle in a (cold) haystack: Searching for neutrino-less double beta decay with the Enriched Xenon Observatory, Physics colloquium, University of Massachusetts, Amherst, MA, USA
- 6/18/2013 Search for Neutrino-less Double Beta Decay with EXO, Physics seminar, IFIC, Valencia, Spain
- 9/27/2012 Neutrino mass: so tiny yet so intriguing, Amherst College physics colloquium, Amherst, MA, USA
- 3/22/2012 First data from the EXO-200 double beta decay experiment, LNGS seminar, Laboratori Nazionali del Gran Sasso, Assergi, Italy
- 10/17/2011 Swoooooosh goes the neutrino (the OPERA results and super-luminal neutrinos), UMass physics brown bag seminar, UMass Amherst, Amherst, MA, USA
- 10/4/2011 First physics from the EXO-200 double beta decay experiment, LNS seminar, MIT, Cambridge MA, USA
- 9/20/2011 Two nu's is good news (but no nu's would be priceless!), UMass physics brown bag seminar, UMass Amherst, Amherst, MA, USA
- 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, Bloomington, IN, USA
- 4/28/2010 Noble endeavors measuring neutrino mass and searching for dark matter with the EXO and Darkside experiments, Physics colloquium, University of Massachusetts, Amherst, MA, USA
- 4/22/2010 The EXO double beta decay experiment, Physics seminar, Yale University New Haven, CT, USA
- 2/24/2010 Solar Neutrino Science with Borexino, Physics seminar, University of Maryland, College Park, MD, USA
- 12/8/2009 A walk on the Dark Side, UMass physics brown bag seminar, UMass Amherst, Amherst, MA, USA
- 2/17/2009 Detecting Double Beta Decay past, present and future: lessons in neutrino physics, UMass physics brown bag seminar, UMass Amherst, Amherst, MA, USA

---

## 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
9/2019—present	Personnel Sub-Committee (Full Professor Rep.; Chair since 1/2010)
9/2018—8/2019	Personnel Sub-Committee (Associate Professor Representative)
9/2010—8/2011	Personnel Sub-Committee (Assistant Professor Representative)
1/2009—present	Personnel Committee
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 Experimentalist)
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 Committee
9/2009—5/2012	Chancellor's Junior Faculty Fellow

---

## Funding

5/1/2018—4/30/2022	NSF (number TBD)	\$TBD	PI: Andrea Pocar Collaborative Research: DarkSide-20k: A Global Program for the Direct Detection of Dark Matter Using Low-Radioactivity Argon (Lead PI: Cristiano Galbiati, Princeton U)
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 (fund equally shared among PIs)
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 (UMass) 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 (UMass) 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 (UMass) 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	<b>Wesley Gillis</b>	
3	11/2017—12/2020	<b>Michal Tarka</b>	Research Associate since 11/2018
2	7/2009—7/2014	<b>Tim Daniels</b>	Current position: Assistant Professor University of North Carolina, Wilmington
1	9/2010—2/2013	<b>John David Wright</b>	Adjunct postdoc

### Graduate Students

11	1/2020—7/2020	<b>Winnie Wang</b>	nEXO Master's student, Worked on light collection studies for nEXO with Chroma software; Now: PhD student at other university
10	10/2019—6/2020	<b>Emmanuele Picciau</b>	DarkSide Visiting PhD student from Cagliari, Italy
9	1/2019—present	<b>Seth Thibado</b>	EXO-200 and nEXO Second year, pre-quals
8	6/2018—present	<b>Matthew Downing</b>	DarkSide (DS-50 and DS-20k) Second year, pre-quals
7	6/2014—present	<b>Sara Feyzbakhsh</b>	EXO-200 and nEXO Passed quals, research active
6	6/2014—9/2018	<b>Alissa Monte</b>	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
5	12/2011—9/2016	<b>Sereres Johnston</b>	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 national lab
4	9/2015—5/2016	<b>Michael Nieslony</b>	Borexino (SOX) Master's exchange student from KIT Karlsruhe, Germany Now: PhD physics student in Germany
3	9/2013—8/2015	<b>Tom Alexander</b>	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 national lab
2	6/2010—5/2014	<b>Keith Otis</b>	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	<b>Jessica Cook</b>	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.)

## Other Graduate Student Committees

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

9	1/2021—5/2021	<b>Rishika Kumar</b>	LXe lab Under school of origin: University of Massachusetts, Amherst
8	8/2019—12/2020	<b>Michelle Wellman</b>	LXe lab Undergraduate school of origin: Mount Holyoke College
7	6/2018—5/2019	<b>Mufid Alfaris</b>	nEXO Undergraduate school of origin: University of Massachusetts, Amherst Current status: Engineer at Energetiq
6	8/2017—8/2018	<b>Dan Kodroff</b>	nEXO Undergraduate school of origin: Penn State University Current status: PhD physics student at Penn State University
5	1/2015—5/2016	<b>Jacob Rose</b>	LXe lab Undergraduate school of origin: University of Massachusetts, Amherst
4	5/2014—5/2016	<b>Jacopo Dalmasson</b>	nEXO (at SLAC after 10/2015) Undergraduate school of origin: University of Milano-Bicocca, Italy Current status: PhD physics student at Stanford University
3	1/2015—8/2015	<b>Ed Lipchus</b>	SiPM testing Undergraduate school of origin: Hampshire College
2	XX/2014—XX/2015	<b>Josh Bonatt</b>	EXO-200 Hands-on operator at the WIPP site, Carlsbad, NM. Undergraduate school of origin: University of Massachusetts, Amherst

2	5/2014—10/2015	<b>Gary Forster</b>	DarkSide	Argon extraction (at Cortez, CO) and purification (at Fermilab) Undergraduate school of origin: University of Massachusetts, Amherst
1	9/2011—5/2012	<b>Amanda Lund</b>	Borexino and DarkSide (at LNGS)	Undergraduate school of origin: University of Massachusetts, Amherst

### Undergraduate Students

58	2/2020—present	<b>Shamus Flynn</b>	nEXO	Graduation date: 5/2023 Project: SolidWorks technical drawing
57	2/2020—present	<b>Thomas Pinto Franco</b>	nEXO	Graduation date: 5/2023 Project: LabView programming
56	5/2019—present	<b>Cole Mirabito</b>	nEXO	Graduation date: 5/2021 Senior thesis: Characterization of ionization charge tiles for nEXO
55	5/2019—present	<b>Reed Cohen</b> (Hampshire College)	LXe lab	Graduation date: 5/2021 Project: Database framework for SiPM data; SiPM characterization data analysis
54	4/2019—present	<b>Rishika Kumar</b>	nEXO	Graduation date:12/2021 Project: Chroma optical simulations
53	2/2018—present	<b>Jack Bolster</b>	nEXO	Graduation date: 5/2021 Senior thesis: Characterization of SiPM detectors in liquid xenon Project: LabVIEW control system for LXe test setup
52	5/2019—3/2020	<b>William Kotlinski</b>	nEXO	Project: LXe operations, SolidWorks modeling
51	1/2019—5/2019	<b>Aaron Lage</b>	nEXO	Project: Laboratory computing infrastructure
50	2/2018—5/2019	<b>Maija Orlovski Nagels</b>	Xenon lab	
49	6/2018—12/2018	<b>Andrew Palmer</b>	Borexino	Project: Borexino data validation.
48	9/2016—5/2019	<b>John Blatchford</b>	nEXO	Senior thesis: Characterization of Silicon Photomultipliers for the nEXO Neutrinoless Double Beta Decay Experiment UMass Amherst, May 2019
47	9/2016—12/2018	<b>Shashank Jayakumar</b>	DarkSide	Project: DS-20k simulations
46	9/2016—8/2018	<b>Anwesha Saha</b>	Xenon lab	Projects: i) Optical Simulations of SiPMs in a liquid xenon system using Chroma; ii) Characterization of a mechanical cryocooler
45	Summers 2017/18	<b>Raj Kumar</b> (Brown University)	Xenon lab	Project: Data analysis for SiPM tests
44	2/2016—8/2018	<b>Ian Murphy</b>	Xenon lab	Projects: Building a Muon-tagging Telescope; SiPM cryogenic tests in vacuum
43	1/2017—5/2018	<b>Matt Downing</b>	EXO-200 and nEXO	Senior thesis: Studying the presence of krypton-85 in the DarkSide detector, UMass Amherst, May 2018
42	1/2017—5/2018	<b>Mufid Alfaris</b>	nEXO	Project: nEXO cathode prototyping

41	9/2016—12/2017	<b>Sonya Leaf</b> Project: DS-50 data analysis	DarkSide
40	1/2016—12/2017	<b>Matt Burke</b> Project: Temperature characterization of SiPM test station	Xenon lab
39	9/2015—5/2017	<b>Kaylee Spitaels</b> Senior project: Prototyping a cathode for nEXO	nEXO
38	9/2014—5/2017	<b>Charles Mark Lewis</b> Senior project: Xenon condenser and SiPM testing	nEXO
37	1/2015—12/2016	<b>Jackson Gibney</b> Project: LabVIEW control system for LXe test setup	nEXO
36	1/2015—10/2016	<b>Jeffrey Ames</b> Project: In-vacuum cryogenic test setup for Si photosensors	nEXO
	6/2015—5/2016	<b>Olivia Comeau</b> Project: Analysis of data from a radon detector for air	DarkSide
35	9/2014—5/2016	<b>Eddie Gelberg</b> Senior thesis: Characterization of silicon photomultipliers for use in the next Enriched Xenon Observatory, UMass Amherst, May 2017	nEXO
34	9/2015—5/2016	<b>Mitch Negus</b> Senior thesis: Diagnostically simulating radon progeny at the nEXO cathode, UMass Amherst, May 2016	nEXO
33	9/2015—5/2016	<b>Beryl Bell (Hampshire College)</b> 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	EXO-200
32	1/2015—5/2016	<b>Trey Nasser</b> Project: Slow-control programming with LabVIEW and maintenance	LXe lab
31	9/2014—12/2015	<b>Javier King</b> Project: Geant4 simulations of ancestor particles	EXO-200
30	2/2015—8/2015	<b>Else Schlerman (Wellesley College)</b> Project: Study of alpha backgrounds in DS-50	DarkSide
29	9/2014—5/2015	<b>Molly Kelly-Gorham</b> Project: Characterization of Photosensors for Use in Liquid Xenon	nEXO
28	9/2013—5/2015	<b>Dan Shy</b> Senior project: Construction of a Xenon Cryostat and Purification System	nEXO
27	9/2013—5/2015	<b>Adam Zec</b> Senior Project: Understanding Backgrounds in the DarkSide-50 Detector	DarkSide
26	9/2013—5/2015	<b>Owen Mannion</b> Senior project: Ab-initio simulations of neutron propagation	Simulations
25	6/2014—12/2014	<b>Ed Lipchus</b> Senior thesis: Testing silicon photosensors at LXe temperature, Hampshire College, December 2014	Photosensor testing
24	1/2014—12/2014	<b>Raymond Elias-Cartwright</b> Project: tests of APDs at cryogenic temperature	Xenon lab



23	9/2013—12/2014	<b>Chris Bert</b>	Xenon lab Project: Instrumentation slow control
22	6/2013—12/2014	<b>Jasmine Abdollahi</b>	EXO-200 Project: EXO-200 deradonator
21	9/2012—5/2014	<b>Arthur Kurlej</b>	DarkSide Project: DS-50 data validation and analysis
20	9/2012—5/2014	<b>Gary Forster</b>	DarkSide/EXO-200 Projects: DarkSide radio-assays; EXO-200 deradonator
19	9/2011—5/2014	<b>Kirsten Randle</b>	DarkSide/EXO-200 Projects: DS-50 analysis; EXO-200 deradonator
18	10/2010—5/2013	<b>Kelly Malone</b>	EXO-200 Senior project: Development of the slow control system for a radon filter for the EXO-200 experiment, UMass Amherst, May 2013
17	9/2011—5/2013	<b>Cameron MacKeen</b>	EXO-200 Senior thesis: Cryogenic tests of LAAPDs in vacuum
16	9/2011—5/2013	<b>Mark Lodato</b>	EXO-200 Senior project: Design of a xenon liquefaction system
15	9/2011—5/2013	<b>Monica Harrelson</b>	EXO Project: Investigating heating strategies for ion release
14	9/2012—5/2013	<b>John Howard</b>	Borexino Senior project: Study of multi-variate analysis techniques for background discrimination
13	9/2012—5/2013	<b>Brian Harvie</b>	Xenon lab Project: Hardware selection for EXO-200 deradonator
12	1/2012—5/2013	<b>Monica Harrelson</b>	EXO Project: Tests of heating strategies for ion release from surfaces
11	1/2012—5/2012	<b>Josh Bonatt</b>	Xenon lab Project: Data analysis of proton-irradiated xenon
10	9/2010—5/2012	<b>Alex Nemtzow</b>	DarkSide Senior thesis: DS-10 detector and DS-50 data analysis, UMass Amherst, May 2012
9	9/2010—5/2012	<b>Chris Dunay</b>	Xenon lab Project: Xenon flasher for scintillation studies
8	Summer 2011	<b>Gavin Myers</b> (Bard College)	EXO Project: Design of an LAAPD holder for Ba-tagging studies
7	9/2010—5/2011	<b>Tyler DeMarco</b>	Instrumentation Senior project: Design of Radon Emanation Chamber for Low Background Particle Physics, UMass Amherst, May 2012
6	9/2009—5/2011	<b>Amanda Lund</b>	Borexino Senior thesis: Study of Borexino radon-related backgrounds
5	9/2009—5/2011	<b>Keith Fratus</b>	Borexino Senior thesis: Cosmic muon tagging via multi-variate analysis
4	9/2009—5/2011	<b>John Quirk</b>	Borexino Senior thesis: Multivariate carbon-11 background tagging
3	9/2009—5/2011	<b>Chris Sterpka</b>	EXO-200 Project: EXO-200 APD light map programming

2	9/2009—5/2011	<b>Andy Dowd</b>	Xenon lab Projects: Design of an educational spark chamber
1	9/2009—5/2011	<b>Brandon Kyle Schmoll</b>	EXO Senior thesis: Xenon lab initial arrangement