

ANDREY L. ELAGIN

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EDUCATION and TRAINING

Post-Doctoral Scholar	University of Chicago	2011 – present
Ph.D., <i>Physics</i>	Texas A&M University	2006 – 2011
Junior Researcher	Joint Institute for Nuclear Research	2002 – 2006
M.S., <i>Physics</i>	Moscow Institute of Physics and Technology	2003 – 2005
B.S., <i>Physics</i>	Moscow Institute of Physics and Technology	1999 – 2003

PUBLICATIONS

Selected publications only. Full list of over 300 publications is available upon request.

Probing the Standard Model and Beyond

- A. Elagin, J. Kumar, P. Sandick, F. Teng, “On the Prospects for Detecting a Net Photon Circular Polarization Produced by Decaying Dark Matter”, arXiv:1709.03058, submitted to Phys. Rev. D
- T. Aaltonen et al., (CDF Collaboration), “Combination of searches for the Higgs boson using the full CDF data set”, Phys. Rev. D88, (2013) 052013
- T. Aaltonen et al., (CDF Collaboration, D0 Collaboration), “Evidence for a Particle Produced in Association with Weak Bosons and Decaying to a Bottom-Antibottom Quark Pair in Higgs Boson Searches at the Tevatron”, Phys. Rev. Lett. 109, (2012) 071804
- A. Bolshakova et al., “Revisiting the ‘LSND anomaly’ II: critique of the data analysis”, Phys. Rev. D85 (2012) 092009
- A. Bolshakova et al., “Revisiting the ‘LSND anomaly’ I: impact of new data”, Phys. Rev. D85 (2012) 092008
- A. Bolshakova et al., “Cross-section of large-angle hadron production in proton- and pion-nucleus interactions I: beryllium nuclei and beam momenta of +8.9 GeV/c and -8.0 GeV/c”, Eur. Phys. J. C62 2 (2009) 293

New experimental techniques

- A. Elagin et al., “Separating Double-Beta Decay Events from Solar Neutrino Interactions in a Kiloton-Scale Liquid Scintillator Detector by Fast Timing”, Nucl. Instr. Meth. Phys. Res. A849, (2017) 102
- C. Aberle, A. Elagin, H. J. Frisch, M. Wetstein, L. Winslow, “Measuring Directionality in Double-Beta Decay and Neutrino Interactions with Kiloton-Scale Scintillation Detectors”, JINST 9 P06012 (2014)
- *The most known publication (over 100 citations, 3 co-authors, it now has been adopted by the ATLAS Collaboration at the LHC):* A. Elagin, P. Murat, A. Pronko, A. Safonov, “A New Mass Reconstruction Technique for Resonances Decaying to tau tau”, Nucl. Instr. Meth. Phys. Res. A654, (2011) 481
- A. Elagin, P. Murat, A. Pronko, A. Safonov, “Probabilistic particle flow algorithm for high occupancy environment”, Nucl. Instr. Meth. Phys. Res. A705, (2013) 93
- A. E. Ball et al., “C2GT: intercepting CERN neutrinos to Gran Sasso in the Gulf of Taranto to measure Θ_{13} .” Eur. Phys. J. C49 4 (2007) 1117

Large-Area Picosecond Photo-Detectors (LAPPD - new instrumentation for discoveries)

- E. Angelico et al., “Capacitively Coupled Pickup in MCP-based Photodetectors Using a Conductive Metallic Anode”, Nucl. Instr. Meth. Phys. Res. A846, (2017) 75

- B. Adams et al., “Timing Characteristics of Large Area Picosecond Photodetectors”, Nucl., Instr. Meth. Phys. Res. **A795**, (2015) 1
- B. Adams et al., “An Internal ALD-based High Voltage Divider and Signal Circuit for MCP-based Photodetectors”, Nucl., Instr. Meth. Phys. Res. **A780**, (2015) 107.
- M. Minot et al., “Pilot Production and Commercialization of LAPPD”, Nucl., Instr. Meth. Phys. Res. **A787**, (2015) 78
- B. Adams et al., "Measurements of the gain, time resolution, and spatial resolution of a 20x20cm² MCP-based picosecond photo-detector”, Nucl. Instr. Meth. Phys. Res. **A732**, (2013) 392
- *Invited article:* B. Adams et al., “A test-facility for large-area microchannel plate detector assemblies using a pulsed sub-picosecond laser”, Rev. Sci. Instrum. **84** 061301 (2013)

Other selected publications

- A. Bolshakova et al., "HARP–CDP hadroproduction data: comparison with FLUKA and GEANT4 simulations", Eur. Phys. J. **C70** 3 (2010) 543
- A. Bolshakova et al., “Comparison of GEANT4 hadron generation with data from the interactions with beryllium nuclei of +8.9 GeV/c protons and pions and -8.0 GeV/c pions”, Eur. Phys. J. **C56** (2008) 323
- V. Ammosov et al., "The HARP Time Projection Chambers: Characteristics and Physics Performance", Nucl. Instrum. Meth. Phys. Res. **A588** (2008) 294
- V. Ammosov et al., “The HARP Resistive Plate Chambers: Characteristics and Physics Performance”, Nucl. Instr. Meth. Phys. Res. **A578** (2007) 119

TALKS

Conference presentations on new ideas

- "Event Reconstruction Techniques for a (water-based) Liquid Scintillator Detector", **TAUP 2017, XV International Conference on Topics in Astroparticle and Underground Physics**, Sudbury, July 2017
- “Using Photons Drift Time to Reconstruct Nuclear Processes and PET Event Topologies”, **10th International Topical Meeting on Industrial Radiation and Radioisotope Measurement Applications**, Chicago, July 2017
- “Directional Liquid Scintillator Detector”, **Coordinating Panel for Advanced Detectors of the American Physical Society**, Caltech, October 2016
- “Directional Liquid Scintillator Detector for Neutrinoless Double-Beta Decay” (*poster presentation*), **International Conference on High Energy Physics (ICHEP)**, Chicago, August 2016
- “Optical Time Projection Chamber” (*talk given on behalf of E. Oberla*), **Coordinating Panel for Advanced Detectors of the American Physical Society**, UT Arlington, October 2015
- “Measuring Directionality in Double-Beta Decay and Neutrino Interactions with Kiloton-Scale Scintillation Detectors” (*slides presented by H. Frisch*), **3rd International Conference on Technology and Instrumentation in Particle Physics**, Beurs van Berlage, June 2014
- “Search for Neutrinoless Double-Beta Decay Using Fast Photo-Detectors and Quantum-Dot-Doped Scintillators”, **Community Summer Study (Snowmass on the Mississippi)**, Minneapolis, August 2013
- “Likelihood-based Particle Flow Algorithm at CDF for Accurate Energy Measurement and Identification of Hadronically Decaying Tau Leptons”, **International Workshop on Advanced Computing and Analysis Techniques in Physics Research**, Jaipur, February 2010

- “Likelihood-based Technique for Measuring the Energy of Hadronically Decaying Tau Leptons”, **10-th International Workshop On Tau Lepton Physics**, Novosibirsk, September 2008

Conference technical presentations on instrumentation for new discoveries

- “Development of Large-Area Picosecond Photo-Detectors”, **DUNE Near Detector Workshop**, Fermilab, March 2017
- “Development of Large-Area Picosecond Photo-Detectors”, **3rd Berkeley Workshop on the Direct Detection of Dark Matter**, LBNL, December 2016
- “Recent Progress on Large-Area Picosecond Photo-Detectors”, **International Workshop on Next Generation Nucleon Decay and Neutrino Detectors**, Beijing, November 2016
- “Early Adopters of the Large-Area Picosecond Photo-Detectors”, **International Workshop on Next Generation Nucleon Decay and Neutrino Detectors**, Beijing, November 2016
- “MCP-based Detectors Without Vacuum Transfer”, **International Conference on High Energy Physics (ICHEP)**, Chicago, August 2016
- “LAPPDTM Hermetic Packaging Using an Indium Solder Flat Seal”, **2016 IEEE Symposium on Radiation Measurements and Applications (SORMA)**, Berkeley, May 2016
- “Large Area Picosecond Photo-Detectors and their applications in a directional liquid scintillator detector”, **Coordinating Panel for Advanced Detectors of the American Physical Society**, UT Arlington, October 2015
- “Large Area Picosecond Photo-Detectors and Fast Timing Implications for Neutrino-less Double-Beta Decay Searches”, **Advances in Neutrino Technologies**, UCLA, September 2014
- “Development of a 20x20cm² ‘Hot’ Indium-Alloy Hermetic Seal in an Inert Atmosphere for Photo-Detector Assembly” (*slides presented by H. Frisch*), **3rd International Conference on Technology and Instrumentation in Particle Physics**, Beurs van Berlage, June 2014
- “Large Area Picosecond Photo-Detectors”, **Conference on Light Detection in Noble Elements**, Fermilab, May 2013
- “Measurements of the Gain, Time Resolution, and Spatial Resolution of a 20x20cm MCP-based Picosecond Photo-Detector”, **Vienna Conference on Instrumentation**, February 2013
- “Performance of Microchannel Plates Fabricated Using Atomic Layer Deposition”, **2012 IEEE Symposium on Radiation Measurements and Applications (SORMA)**, Oakland, May 2012
- “The Optimized Sensor Segmentation for the Very Forward Calorimeter”, **International Linear Collider Physics and Detector Workshop**, Snowmass, August 2005

Seminars and Colloquia

- “Reducing Irreducible Background: Revealing the Unique Nature of Neutrino Mass Using Fast Timing”, Physics Department Colloquium, **University of Hawaii**, March 2017
- “Reconstructing the Topology of Neutrinoless Double-Beta Decay Events Using Fast Timing”, Enrico Fermi Institute HEP Seminar, **University of Chicago**, October 2016
- “Directional Liquid Scintillator Detector for Neutrinoless Double-Beta Decay”, Argonne Physics Division Seminar, **Argonne**, March 2016
- “Search for Neutrinoless Double-Beta Decay with Directional Liquid Scintillator Detector”, Institute for Nuclear and Particle Astrophysics Seminar, **Berkeley Lab**, November 2015
- “Neutrinoless Double-Beta Decay and the Development of Large-Area Picosecond Photo-Detectors”, Enrico Fermi Institute HEP Seminar, **University of Chicago**, February 2015

- “How to Measure a Process Much Longer than the Age of the Universe; is the Neutrino its Own Antiparticle”, Physics Department Colloquium, **Drexel University**, March 2014
- “The Development of Large-Area Picosecond Photo-Detectors and Fast Timing Implications for Neutrino-less Double-Beta Decay Searches”, Mitchel Institute Seminar, **Texas A&M University**, October 2013
- “The Development of Large-Area MCP-based Picosecond Photo-Detectors”, HEP Group Seminar, **Stanford University**, January, 2013
- “New Tools for the $H \rightarrow \tau\tau$ Search at the CDF Experiment”, Experimental Group Seminar, **Jefferson Lab**, May 2011

High Energy Physics Lunch Seminars at the Enrico Fermi Institute, University of Chicago

- “Reducing Irreducible Background in Searches for Neutrinoless Double-Beta Decay”, April 2016
- “Hermetic Packaging of the LAPPDs and Fast Timing Implications for Neutrinoless Double-Beta Decay Searches”, October 2013
- “HARP-CDP results on the LSND anomaly”, March 2012
- “New Tools for the Higgs Search in the $\tau\tau$ channel at the CDF Experiment”, September 2011
- “HARP-CDP Results or an Unbiased View at Large Angle”, February 2009

Other selected talks

- “Development of Large-Area Picosecond Photo-Detectors”, **DUNE Near Detector Workshop**, Fermilab, March 2017
- “Development of Large-Area Picosecond Photo-Detectors”, **3rd Berkeley Workshop on the Direct Detection of Dark Matter**, LBNL, December 2016
- “ $0\nu\beta\beta$ -decay Event Topology Reconstruction”, **topical workshop for THEIA (FroST – Frontiers of liquid Scintillator Technology)**, Mainz, October 2016
- “Large-Area Picosecond Photodetectors”, **topical workshop for THEIA (FroST – Frontiers of liquid Scintillator Technology)**, Mainz, October 2016
- “UChicago Ultra-Lightweight LAPPD Tile Facility”, NGA Program Planning Meeting, **Berkeley**, November 2014
- “Flat-to-Flat Solder Seal”, ANL DOE review, **Argonne**, May 2014
- “Search for Neutrino-less Double-Beta Decay Using Fast Timing Detectors”, LAPPD Early Adopter Users Meeting, **Incom Inc.**, November 2013
- “Precision Timing for Higgs Physics Detectors”, Higgs Snowmass Workshop, **Princeton**, January 2013
- “Hermetic packaging”, LAPPD DOE review, **Argonne**, December 2013
- “Timing Properties of MCPs with ALD”, Project X Physics Study, **Fermilab**, June 2012
- “Large Area Picosecond Photo-Detectors”, Project X Physics Study, **Fermilab** June 2012
- “New Tools for the Higgs Search in the $\tau\tau$ channel at the CDF Experiment”, New Perspectives Conference, **Fermilab**, May 2011
- “Improved search for a Higgs boson in the $H \rightarrow \tau\tau$ decay channel at CDF”, **APS April Meeting, Denver**, May 2009
- “A New Algorithm for Measuring the Energy of Hadronically Decaying Tau Leptons”, **APS April Meeting**, St. Louis, April 2008
- “BeamCal MC Simulation” (*slides presented by W.Lohmann*), **7th FCAL Workshop: Collaboration Meeting**, Tel Aviv, September 2005

- “Low Angle Bhabha Events and Electron Veto. Comparison between Different Crossing Angle Designs” (*slides presented by W.Lohmann for V.Drugakov and A.Elagin*), **Stanford**, March 2005
- “Impact of Bhabha events on the Veto for different crossing angles”, 6th FCAL Workshop on the Simulation of the Very Forward Detectors, **DESY-Zeuthen**, February 2005
- “BeamCal simulation based on Geant-4”, Linear Collider Simulation Mini Workshop, **DESY-Hamburg**, December 2004
- “Radiative Bhabha scattering at low angles in the TESLA Forward Calorimeter” (*talk given by V. Drugakov*), 5th FCAL Workshop on Forward Region Instrumentation, **DESY-Zeuthen**, August 2004
- “Impact of Bhabha scattering on the BeamCal performances” (*slides presented by W.Lohmann for V.Drugakov and A.Elagin*), **International Conference on Linear Colliders**, Paris, April 2004