

Benjamin J. P. Jones

Curriculum Vitae

(updated 08/31/20)

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Present Affiliation:

2016 - **University of Texas at Arlington**
Assistant Professor
Department of Physics

Professional Preparation:

2015 - 2016 **University of Texas at Arlington**
Postdoctoral Researcher
Mentor: Dr. David Nygren, Presidential Distinguished Professor of Physics

2010 – 2015 **Massachusetts Institute of Technology**
PhD in Physics
Research advisor: Prof. Janet Conrad
Thesis title: “Sterile Neutrinos in Cold Climates”

2004 – 2009 **University of Cambridge (Selwyn College), UK**
B.A. M.Sci. Natural Sciences, First Class
Specialization: Experimental and Theoretical Physics

Awards and Fellowships:

2018 UTA College of Science Research Excellence Award (UTA)
2017 Mitsuyoshi Tanaka Dissertation Award in Experimental Particle Physics (APS)
2015 Martin Deutsch Award for Excellence in Experimental Physics (MIT)
2010 URA Graduate Research Fellowship, Fermilab
2009 MIT Frank Fellowship
2008 Siddans Prize for Physics, Selwyn College, Cambridge University
2006 Scholar of Selwyn College, Cambridge

Funding:

2019 WoU-MMA: IceCube Data Analysis in the U.S.
\$175,000 (1yr) from National Science Foundation

2018 Early Career Award: Single Molecule Fluorescence Imaging for a Background-Free
Neutrinoless Double Beta Decay Search
\$750,000 (5 yr), DOE Nuclear Physics

2018	Searching for Neutrinoless Double Beta Decay with High Pressure Xenon Gas \$521,500 of total award \$1,043,000 (3 yr), DOE Nuclear Physics
2017	High-Pressure Xenon Gas TPC Development \$82,000 (1 yr), DOE Nuclear Physics
2017	Research in Elementary Particle Physics \$100,083 of total award \$4,699,792 (3 yr), DOE High Energy Physics

Collaboration Membership:

IceCube Collaboration <i>(Neutrino Oscillations Physics Working Group Lead)</i>	2014 – present
NEXT Collaboration <i>(Member of Speakers and Readers Committee)</i>	2015 – present
DUNE Collaboration	2013 – present
MicroBooNE Collaboration	2010 – 2015
SciBooNE Collaboration	2010 – 2012

Publications with Leading Contributions:

1. *An eV-scale sterile neutrino search using eight years of atmospheric muon neutrino data from the IceCube Neutrino Observatory*
M.G. Aartsen et al (IceCube Collaboration)
Accepted by Physical Review Letters, arXiv:2005.12942 (2020)
2. *Searching for eV-scale sterile neutrinos with eight years of atmospheric neutrinos at the IceCube neutrino telescope*
M. G. Aartsen et al (IceCube Collaboration)
Accepted by Physical Review D, arXiv:2005.12943 (2020)
3. *Barium Selective Chemosensing by Diazacrown Ether Naphthalimide Turn-on Fluorophores for Single Ion Barium Tagging*
P. Thapa, N. K. Byrnes, F.W. Foss, Jr., B.J.P. Jones, J. X. Mao, K. Nam, C.A. Newhouse, D.R. Nygren, A.D. McDonald, T.T. Vuong, and K. Woodruff
Unver Review by RSC Chemical Science, arXiv:2006.09494 (2020)
4. *Sensitivity of a Tonne-scale NEXT Detector for Neutrinoless Double Beta Decay Searches*
C. Adams et al (NEXT Collaboration)
Submitted to Journal of High Energy Physics, arxiv:2005.06467 (2020)
5. *Electron Transport in Gaseous Detectors with a Python-based Monte Carlo Simulation Code*
B. Al Atoum, S. F. Biagi, D. Gonzalez-Diaz, B.J.P Jones, and A.D. McDonald
Computer Physics Communications, Volume 254, September 2020, 107357
6. *Mitigation of Backgrounds from Cosmogenic ^{137}Xe in Xenon Gas Experiments using ^3He Neutron Capture*

- L. Rogers et al (NEXT Collaboration)
Journal of Physics G (Nuclear and Particle Physics) 47, no. 7 (2020): 075001
7. *Barium Chemosensors with Dry-Phase Fluorescence for Neutrinoless Double Beta Decay*
P. Thapa, I. Arnquist, N. Byrnes, A.A. Denisenko, F.W. Foss, B.J. P. Jones, A.D. McDonald, D.R. Nygren, K. Woodruff
Nature Scientific Reports 9, 15097 (2019)
 8. *Radio Frequency and DC High Voltage Breakdown of High Pressure Helium, Argon, and Xenon*
K. Woodruff *et al.* (NEXT collaboration)
Journal of Instrumentation 15 (2019) no.04, P04022
 9. *Neutrino Oscillations in a Quantum Processor*
C.A. Argüelles and B.J.P. Jones
Physical Review Research 1, 033176 (2019)
 10. *Efficient propagation of systematic uncertainties from calibration to analysis with the SnowStorm method in IceCube*
M.G. Aartsen *et al.* (IceCube Collaboration)
Journal of Cosmology and Astroparticle Physics 10 (2019) 048
 11. *Electron Drift and Longitudinal Diffusion in High Pressure Xenon-Helium Gas Mixtures*
A.D. McDonald *et al.* (NEXT collaboration)
Journal of Instrumentation 14 (2019) no.08, P08009
 12. *Emanation and bulk fluorescence in liquid argon from tetraphenyl butadiene wavelength shifting coatings*
J. Asaadi, B.J.P. Jones, A. Tripathi, I. Parmaksiz, H. Sullivan, Z.G.R. Williams
Journal of Instrumentation 14 (2019) no.02, P02021
 13. *Demonstration of Single Barium Ion Sensitivity for Neutrinoless Double Beta Decay using Single Molecule Fluorescence Imaging*, A.D. McDonald, B.J.P. Jones, *et al* (NEXT collaboration)
Physical Review Letters 120, 132504 (2018) [Editors selection]
 14. *Mobility and Clustering of Barium Ions and Dications in High Pressure Xenon Gas*
E. Bainglass, B.J.P. Jones, F. W. Foss Jr, M. N. Huda and D. R. Nygren
Physical Review A 97, 062509 (2018)
 15. *A New Light Higgs Boson and Short-Baseline Neutrino Anomalies*
J. Asaadi, E. Church, R. Guenette, B.J.P. Jones, A.M. Szelc
Physical Review D 97 (2018) no.7, 075021
 16. *High Voltage Insulation and Gas Absorption of Polymers in High Pressure Argon and Xenon Gases*
L. Rogers *et al.* (NEXT collaboration)
Journal of Instrumentation 13 (2018) no.10, P10002
 17. *Neutrinoless Double Beta Decay with $^{82}\text{SeF}_6$ and Direct Ion Imaging*
D.R. Nygren, B.J.P. Jones, N. Lopez-march, Y. Mei, F. Psihas and J. Renner
Journal of Instrumentation 13 (2018) no.03, P03015
 18. *Solar Atmospheric Neutrinos and the Sensitivity Floor for Solar Dark Matter Annihilation Searches*
C.A. Argüelles, G. de Wasseige, A. Fedynitch and B.J.P. Jones
Journal of Cosmology and Astroparticle Physics 1707 (2017) no.07, 024

19. *Searches for Sterile Neutrinos with the IceCube Detector*
M.G. Aartsen et al. (IceCube Collaboration)
Physical Review Letters 117 (2016) no.7, 071801 [*Editors selection*]
20. *Single Molecule Fluorescence Imaging for Barium Tagging in Neutrinoless Double Beta Decay*
B.J.P. Jones, A.D. McDonald and D.R. Nygren
Journal of Instrumentation 11 (2016) no.12, P12011
21. *Dynamical pion collapse and the coherence of conventional neutrino beams*
B.J.P. Jones
Physical Review D 91 (2015) no.5, 053002
22. *The Photomultiplier Tube Calibration System of the MicroBooNE Experiment*
J. Conrad , B.J.P. Jones, Z. Moss, T. Strauss and M. Toups
Journal of Instrumentation 10 (2015) no.06, T06001
23. *Testing of High Voltage Surge Protection Devices for Use in Liquid Argon TPC Detectors*
J. Asaadi, J.M. Conrad, S. Gollapinni, B.J.P. Jones, H. Jostlein, J. M. St. John, T. Strauss, S. Wolbers and J. Zennaro
Journal of Instrumentation 9 (2014) P09002
24. *The Effects of Dissolved Methane upon Liquid Argon Scintillation Light*
B.J.P. Jones, T. Alexander, H.O. Back, G. Collin, J.M. Conrad, A. Greene, T. Katori, S. Pordes and M. Toups
Journal of Instrumentation 8 (2013) P12015
25. *A Measurement of the Absorption of Liquid Argon Scintillation Light by Dissolved Nitrogen at the Part-Per-Million Level*
B.J.P. Jones, C.S. Chiu, J.M. Conrad, C.M. Ignarra, T. Katori and M. Toups
Journal of Instrumentation 8 (2013) P07011
26. *Photodegradation Mechanisms of Tetraphenyl Butadiene Coatings for Liquid Argon Detectors*
B.J.P. Jones, J.K. VanGemert, J.M. Conrad, A. Pla-Dalmau
Journal of Instrumentation 8 (2013) P01013

Full Publication List:

Full publication list (145+ publications in total) available at:

http://inspirehep.net/search?ln=en&ln=en&p=find+a+b.j.p.+jones&of=hb&action_search=Search

Seminars and Colloquia:

Better Neutrinoless Double Beta decay through Biochemistry

UCLA High Energy and Astro-Particle Physics Seminar (Apr 2020)

University of Michigan Particle Physics Seminar (Feb 2020)

Lawrence Berkeley National Laboratory Instrumentation Colloquium (Jan 2020)

University of Chicago Kavli Seminar (Oct 2019)

Penn State University HEP Seminar (Jan 2019)

Southern Methodist University Physics Colloquium (Oct 2018)

Colloquium: The Search for Neutrinoless Double Beta Decay

Illinois Institute of Technology Physics Colloquium (Oct 2019)

Fermilab Neutrino University (Jul 2019)

Texas A&M Commerce Physics Colloquium (Sept 2019)

Colloquium: The IceCube Neutrino Telescope and the Origin of Cosmic Rays

Abilene Christian University Physics Colloquium (Sept 2019)

Trinity University Physics Colloquium, San Antonio, TX (Sept 2018)

High Pressure Xenon Gas TPCs with Single Barium Ion Identification: Progress Toward the first Ton-Scale, Background Free Neutrinoless Double Beta Decay Experiment

Fermilab LHC Physics Center Seminar (Aug 2018)

Rutgers State University of New Jersey HEP Seminar (Jan 2018)

It's 1 in 1,000,000,000,000,000,000,000,000 but it might just work: Reaching the ultra-low background regime in Neutrinoless Double Beta Decay

Ohio State University HEP Seminar (Nov 2017)

University of Texas at Dallas Physics Colloquium (Nov 2017)

Pacific Northwest National Lab HEP seminar (March 2017)

Fermi National Accelerator Laboratory Neutrino Seminar (Dec 2016)

Argonne National Laboratory HEP Seminar (Nov 2016)

Marking the 30th Anniversary of Extra-solar Neutrino Detection from Supernova 1987A

University of Texas at Arlington Colloquium (Jan 2017)

Results of the Search for Sterile Neutrinos with IceCube

Oxford University HEP Seminar (May 2016)

Cambridge University HEP Seminar (May 2016)

Manchester University HEP Seminar (May 2016)

Fermilab Joint Experimental and Theoretical Physics (W&C) Seminar (February 2016)

Sterile Neutrinos, Matter Resonances, and The IceCube Neutrino Telescope

University of Chicago HEP Seminar (February 2016)

UT Arlington Physics Colloquium (January 2016)

NMSU Physics Colloquium (November 2015)

Dynamical Pion Collapse and the Coherence of Neutrino Beams

Northwestern HEP Seminar (May 2015)

SLAC HEP Seminar (April 2015)

UW Madison HEP Seminar (April 2015)

MIT LNS Lunchtime Seminar (March 2015)

UChicago Tuesday HEP Talk (February 2015)

The Physics and Technology of Liquid Argon Scintillation Light

Penn State HEP Seminar (October 2014)

UW Madison WIPAC seminar (May 2014)

Indiana University HEP seminar (April 2014)

Northwestern University HEP seminar (November 2013)

Argonne National Lab HEP seminar (October 2013)

Neutrino Physics in Liquid Argon at Baselines Great and Small

University of Edinburgh HEP seminar (January 2012)

University of Glasgow HEP seminar (January 2012)

Split Supersymmetry and Stopped Gluinos at CMS

University of Bristol HEP seminar (June 2009)

Selected Conference Talks:

1. *The Role of Barium Tagging in the Next Ten Years*, Snowmass Workshop on Neutrinoless Double Beta Decay, virtual, 2020.
2. *The NEXT Experiment*, Invited talk at APS April Meeting, Washington DC (virtual), 2020
3. *Single Molecule Fluorescence Imaging to resolve the Matter/Antimatter Asymmetry of the Universe*, North Texas Photonics Workshop, Arlington, TX 2020
4. *The NEXT Experiment*, CPAD, Madison 2019
5. *Barium tagging in High Pressure Xenon Gas*, Stopping and Manipulation of Ions, Montreal, 2019
6. *The NEXT Experiment*, Conference on Science at SURF, Rapid City, 2019
7. *Review of Xenon Double Beta Decay Experiments*. CPAD 2017, Albuquerque, NM
8. *Light Collection in Neutrino Experiments*; LIDINE 2017, Menlo Park, CA
9. *The NEXT Experiment*; DPF2017, Batavia, IL
10. *Tanaka Prize award speech: Sterile Neutrinos in Cold Climates*; DPF2017, Batavia, IL
11. *Single Molecule Fluorescence Imaging for Barium Tagging in Neutrinoless Double Beta Decay*; ICHEP 2016, Chicago, IL
12. *The Status of the NEXT experiment*, NuFact2016, Quy Nhon, Vietnam
13. *Results of the IceCube Search for eV Scale Sterile Neutrinos*, NuFact2016, Quy Nhon, Vietnam
14. *Dynamical Pion Collapse and the Coherence of Conventional Neutrino Beams*, INT Workshop on Neutrino Astrophysics and Fundamental Properties 2015, Seattle, WA
15. *Dynamical Pion Collapse and the Coherence of Conventional Neutrino Beams*, Pheno2015, Pittsburg, PA
16. *High Voltage Surge Protection for Liquid Argon TPCs*, FNAL LArTPC Workshop 2014, Batavia, IL
17. *Introduction to Liquid Argon Scintillation Light*, Fermilab LArTPC Workshop 2014, Batavia, IL
18. *Scintillation Detector Development for Liquid Argon TPC Experiments*, ICATPP 2013, Como, Italy
19. *Photodegradation Mechanisms of Tetraphenyl Butadiene*, ANT2013, Tahoe, CA
20. *Results from the Bo Argon Scintillation Test Stand at Fermilab*, LIDINE 2013, Batavia, IL
21. *Optical Simulation and Reconstruction with LArSoft*, Fermilab LArTPC Workshop 2013, Batavia, IL

Teaching

Graduate Quantum Mechanics I (Fall 2018);

Graduate Quantum Mechanics II (Spring 2017, Spring 2018, Spring 2019);

Graduate Particle Physics I (Fall 2017, Spring 2020);

Undergraduate Modern Physics (Fall 2020);

UTA Qualls Quantum Mechanics Preparatory Classes (Summer 2017 - present)

Service and Outreach:

- 1. Organization:** Snowmass Community Planning Process, Neutrino Properties co-Lead (2019-)
Snowmass Workshop on Beyond-Ton-Scale 0nubb co-organizer (2020)
Coordinating Panel for Advanced Detectors, Organizing Committee (2019)
Coordinating Panel for Advanced Detectors, Noble Elements Convener (2018)
Workshop on Ton-Scale, Gas-Phase 0nubb, Local Org Committee (2017)
- 2. Reviewer (journals):** Nature; Phys Lett B; Journal of Instrumentation; Topics in Nuclear Science.
Reviewer (proposals): NSF AMO 2020; DOE NP 2019; DOE HEP 2017, 2020;
DOE SBIR 2015-2020.
- 3. University Service:** UTA Physics Colloquium Committee (2017-2018);
UTA Physics Graduate Recruitment Committee (2019-2020);
UTA Physics Graduate Admissions Committee (2020);
UTA Physics Machine Shop Committee (2017-present)
- 4. Diversity & Inclusion:** Founding member of the *IceCube Diversity Taskforce* 2016 – present;
Initiator & leader of IceCube speakers gender & minority bias study;
Leader & sponsor of “*UTA You Are Welcome Here*” LGBTQA campaign.
- 5. Outreach:** Lead organizer of UTA High Energy and Nuclear Physics summer camp for high school students (in person) 2016, 2017, 2018 and (virtual) 2020.
(<https://utahepcamp.wordpress.com>)

Co-founder and faculty liaison for Tap Talks DFW, monthly science events for the general public in local micro-breweries, 2018-present.
(<https://dfwtaptalks.wordpress.com>).

Recent outreach talks:
- *Neutrinos, Parallel Universes and the Direction of Time (webinar), May 2020*
- *Tap Talks: It from Qubit (public talk), Sept 2019*
- *Tap Talks: Schrödinger’s Cats, Decoherence and Quantum Consciousness (public talk) Sept 2018*
- *Physics coach for Theater Arlington, “Einstein, A Stage Portrait” (stage production), July 2017.*

References

Available on request