

# Brent S. Budden

## Curriculum Vitae

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Citizenship: United States

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### EDUCATION

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*Louisiana State University, College of Science, Baton Rouge, LA*

**Ph.D. Physics, May 2011 · GPA 3.90/4.00**

Dissertation: "Characterization and Prototyping of the Rotating Modulator Hard X-ray/Gamma-ray Telescope"

*University of Pennsylvania, College of Arts & Sciences, Philadelphia, PA*

**B.A., May 2005 · GPA: 3.27/4.00**

Major: Physics, concentration in Physical Theory & Experimental Technique

Minor: Mechanical Engineering and Applied Mechanics

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### RESEARCH INTERESTS

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Radiation Detector Development, X-ray / Gamma-ray Imaging Modalities, Image Reconstruction / Data Deconvolution

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### WORK EXPERIENCE

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*Los Alamos National Laboratory, Los Alamos, NM*

**Postdoctoral Research Associate, August 2011 – Present**

As part of the Space Science and Applications group of the Intelligence and Space Research division (ISR-1), contribute to multiple collaborative projects including detector development for radioisotope identification, research and analysis of scintillation mechanisms, and simulations and design of hard x-ray / gamma-ray imaging instruments.

*Louisiana State University, Baton Rouge, LA*

**Graduate Student Researcher, June 2005 – August 2011**

Principal developer of gamma-ray imager. Analytically derive instrument characterization, design mechanics, layout and develop software, formulate imaging algorithms. Perform experimental testing, produce and deliver presentations and reports to lab group and at international conferences, participate in collaborative meetings, and deliver design instructions for electronic and mechanical components. Manage and delegate work to undergraduate student.

*University of Pennsylvania, Philadelphia, PA*

**Undergraduate Student Researcher, June 2004 – May 2005**

Mechanical design, part fabrication, and instrument assembly for an experimental cosmology group.

*Self-Employed*

**Web-Developer, January 2000 – Present**

ScriptCrawler.com (2000 – present): Webmaster and owner.

Star Wars Crawl Creator (2010): Designed, created, and sold site concept to Lucasfilm, Ltd.

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### PUBLICATIONS

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- Budden, B.S., Budden, M.R., Case, G.L., Cherry, M.L., "Characteristic Count Rate Profiles for a Rotating Modulation Gamma-Ray Imager," *Astrophysics and Space Science*, 334 (1), p. 61 (2011).
- Budden, B., Case, G.L., Cherry, M.L., "Image Reconstruction with a LaBr<sub>3</sub>-based Rotational Modulator," *Nuclear Instruments and Methods A*, 652(1), p. 610 (2011).
- Budden, B., Case, G.L., Cherry, M.L., "Noise-Compensating Algebraic Reconstruction for a Rotating Modulation Gamma-Ray Imager," submitted, *IEEE Transactions on Nuclear Science* (2010).
- Budden, B., Case, G.L., Cherry, M.L., Guzik, T. G., Isbert, J., Stewart, M.F., "Design Concept for a High Altitude Rotating Modulator Gamma-Ray Imager," *Nuclear Science Symposium Conference Record, 2010, IEEE*, N14-27 (2010).
- Budden, B., Case, G.L., Cherry, M.L., "Imaging Results with a LaBr<sub>3</sub>-based Rotational Modulator," *Nuclear Science Symposium Conference Record, 2009, IEEE*, N13-132 (2009).
- Budden, B., Case, G.L., Cherry, M.L., "Angular Resolution obtained with a LaBr<sub>3</sub>-based rotational modulator," *Hard X-ray, Gamma-Ray, and Neutron Detector Physics, 2009, SPIE*, 7449:1 (2009).
- Budden, B., Case, G.L., Cherry, M.L., "Lanthanum Bromide-based Rotation Modulation Gamma Ray Imager," *Nuclear Science Symposium Conference Record, 2008, IEEE*, N45-1, 2976 (2008).
- Budden, B., Case, G., Cherry, M., Hopson, R., Isbert, J., Sankaran, R., Smith, D., Stewart, M., "Long Duration Balloon Flight Exposure of a Ce:LaBr<sub>3</sub> Crystal," *Nuclear Science Symposium Conference Record, 2008, IEEE*, N60-3, 3347 (2008).

- Budden, B., Case, G.L., Cherry, M.L., Isbert, J., Stewart, M., "Imaging Performance of Lanthanum Bromide Scintillators with Wavelength Shifting Fiber Readout," *Nuclear Science Symposium Conference Record, 2007, IEEE*, 3, 2036-2040 (2007).
- Budden, B., Cherry, M.L., Case, G.L., Isbert, J., Stewart, M., "A High Sensitivity Gamma Ray Imager (HiSGRI) Based on Wavelength-Shifting Fiber Readout of LaBr<sub>3</sub> Scintillators," *Nuclear Science Symposium Conference Record, 2006, IEEE*, 2, 943-949 (2006).

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#### PRESENTATIONS

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- Budden, B., Case, G.L., Cherry, M.L., "Lanthanum Bromide-based Rotation Modulation Gamma Ray Imager," at IEEE/NSS, Dresden, Germany (Oct. 2008).
- Budden, B., Case, G.L., Cherry, M.L., Isbert, J., Stewart, M., "Imaging Performance of Lanthanum Bromide Scintillators with Wavelength Shifting Fiber Readout," at IEEE/NSS, Honolulu, HI (Nov. 2007).

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#### POSTERS

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- Budden, B., Case, G.L., Cherry, M.L., Guzik, T.G., Isbert, J., Stewart, M.F., "Design Concept for a High Altitude Balloon Flight of a Rotational Modulation Gamma-Ray Imager," IEEE NSS 2010 N14-27 (2010).
- Budden, B., Case, G.L., Cherry, M.L., "Rotational Modulation as an Alternative to Coded Aperture Gamma-Ray Imaging," SORMA XII DNDO Workshop, 432-18 (2010).
- Budden, B., Case, G.L., Cherry, M.L., "Image Reconstruction with a LaBr<sub>3</sub>-based Rotational Modulator," SORMA XII, 395-27 (2010).
- Budden, B., Case, G.L., Cherry, M.L., "Imaging Results with a LaBr<sub>3</sub>-based Rotational Modulator" IEEE NSS 2009 N13-132 (2009).

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#### AWARDS, GRANTS, & FELLOWSHIPS

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- **Louisiana Space Consortium Fellow, August 2006 – Present**
- **LSU Graduate School Charles E. Coates Research Award, August 2009 – July 2010**
- **Finalist for Best Student Paper, IEEE NSS, November 2010**
- **IEEE NSS/MIC Trainee Grant, October 2007 and October 2008**

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#### PROFESSIONAL ASSOCIATIONS

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American Physical Society, American Association of Physicists in Medicine

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#### TECHNICAL SKILLS

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IDL, Matlab, LaTeX, Mathematica, Solidworks, HTML/CSS, PHP/MySQL, MS Office