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EDUCATION:

Washington University in St. Louis	Physics	Ph.D.	2008
Washington University in St. Louis	Physics	A.M.	2001
University of Maryland – College Park	Nuclear Engineering	M.S.	2000
Washington University in St. Louis	Physics	B.S.	1996
Washington University in St. Louis	Mathematics	A.B.	1996

APPOINTMENTS:

Washington University in St. Louis	Research Assistant Professor	2015-Present
Washington University in St. Louis	Research Scientist	2014-2015
Washington University in St. Louis	Postdoctoral Research Associate	2011-2014
HyperTech Systems LLC	Research Physicist	2007-2010

PROFESSIONAL SOCIETY MEMBERSHIP:
American Physical Society

HONORS AND AWARDS:
NASA group achievement award for SuperTIGER experiment 2014

RESEARCH:
Dr. Rauch's research focus has been in cosmic ray astrophysics. He was involved in ultra-heavy galactic cosmic ray (UHGCR) research with the Trans-Iron Galactic Element Recorder (TIGER) experiment as an undergraduate and graduate student and now with SuperTIGER as a Co-I. Dr. Rauch has been involved in the design and modeling of the HNX and TIGERISS future heavy cosmic ray experiments and supported the first SuperTIGER/HNX CERN beam run. He has taken a lead role in Washington University's participation in the CALorimetric Electron Telescope (CALET) experiment to measure electrons, nuclei and gamma rays, launched to the International Space Station (ISS) in 2015. He contributed to four CALET instrument beam tests at CERN and modeling and simulation efforts, and is performing the CALET UHGCR analysis. He has been a Co-I on the Antarctic Impulsive Transient Antenna (ANITA) experiment searching for the highest energy neutrinos and ultra-high energy cosmic rays (UHECR). Dr. Rauch took a lead role in Washington University's ANITA-III integration and flight monitoring efforts, and also in the ANITA-IV integration and flight from McMurdo Station, Antarctica. He had a significant role in the ANITA affiliated SLAC T-510 experiment to demonstrate the geomagnetic radio emission mechanism of UHECR under laboratory conditions. Dr. Rauch also has research experience in hyperspectral image analysis and nuclear reactor safety.

PUBLICATIONS:

Refereed Journal Articles:

D. J. Lawrence, L. M. Barbier, J. J. Beatty, W. R. Binns, E. R. Christian, D. J. Crary, D. J. Ficenec, P. L. Hink, J. Klarmann, K. E. Krombel, J. W. Mitchell, B. F. Rauch, S. H. Sposato, R. E. Streitmatter, and C. J. Waddington (1999). Large-area scintillating time-of-flight/hodoscope detectors for particle astrophysics experiments, *Nucl. Inst. and Meth in Phys Res*. *A*, **420**, 402-415.

S. Kodaira, M. Hareyama, N. Hasebe, T. Miyachi, K. Sakurai, W. R. Binns, J. R. Cummings, M. H. Israel, J. T. Link, B. F. Rauch, L. M. Scott, S. Geier, R. A. Mewaldt, L. M. Barbier, J. W. Mitchell, G. A. de Nolfo, R. E. Streitmatter, and C. J. Waddington (2005). The attenuation length of cosmic-ray iron in the atmosphere obtained by the TIGER experiment, *Intl Journal of Modern Phys. A.*, **20** (29), 6702-6704.

S. Geier, L. M. Barbier, W. R. Binns, E. R. Christian, J. R. Cummings, G. A. de Nolfo, P. L. Hink, M. H. Israel, A. W. Labrador, J. T. Link, R. A. Mewaldt, J. W. Mitchell, B. F. Rauch, S. M. Schindler, L. M. Scott, E. C. Stone, R. E. Streitmatter, and C. J. Waddington (2006). A Search for the Signature of Microquasars in the Cosmic-Ray Iron Spectrum measured by TIGER, *Adv. Sp. Res*, **37** (10), 1955-1959.

B. F. Rauch, J. T. Link, K. Lodders, M. H. Israel, L. M. Barbier, W. R. Binns, E. R. Christian, J. R. Cummings, G. A. de Nolfo, S. Geier, R. A. Mewaldt, J. W. Mitchell, S. M. Schindler, L. M. Scott, E. C. Stone, R. E. Streitmatter, C. J. Waddington, and M. E. Wiedenbeck (2009). Cosmic Ray Origin in OB Associations and Preferential Acceleration of Refractory Elements: Evidence from Abundances of Elements $_{26}$Fe through $_{34}$Se, *Astrophys. J.* **697**, 2083-2088. Erratum (2010) *Astrophys. J.*, **722**, 970.

S. Torii on behalf of the CALET Collaboration (2011). Calorimetric electron telescope mission. Search for dark matter and nearby sources, *Nuclear Inst. and Methods in Physics Research A,* **630** (1), 55-57.

P. S. Marrocchesi for the CALET Collaboration (2012). CALET: A calorimeter-based orbital observatory for High Energy Astroparticle Physics, *Nuclear Inst. and Methods in Physics Research A,* **692**, 240-245.

N. Mori on behalf of the CALET Collaboration (2013). CALET: a calorimeter for cosmic-ray measurements in space, *Nuclear Physics B Proceedings Supplements,* **239** 199-203.

P. Maestro on behalf of the CALET Collaboration (2013). High-energy astroparticle physics with CALET, *Journal of Physics: Conference Series,* **409** (1), article id. 012026.

B. F. Rauch for the CALET Collaboration (2014). Predicted CALET measurements of electron and positron spectra from 3 to 20 GeV using the geomagnetic field, *Adv. Sp. Res*, **53**, 1438-1443.

B. F. Rauch for the CALET Collaboration (2014). Predicted CALET measurements of ultra-heavy cosmic ray relative abundances, *Adv. Sp. Res*, **53**, 1444-1450.

W. R. Binns, R. G. Bose, D. L. Braun, T. J. Brandt, W. M. Daniels, P. F. Dowkontt, S. P. Fitzsimmons, D. J. Hanne, T. Hams, M. H. Israel, J. Klemic, A. W. Labrador, J. T. Link, R. A. Mewaldt, J. W. Mitchell, P. Moore, R. P. Murphy, M. A. Olevitch, B. F. Rauch, K. Sakai, F. SanSebastian, M. Sasaki, G. E. Simburger, E. C. Stone, C. J. Waddington, J. E. Ward, and M. E. Wiedenbeck (2014). The SuperTIGER Instrument Measurement of Elemental Abundances of Ultra-Heavy Galactic Cosmic Rays, *Astrophys. J.*, **788**, 18 (11pp).

O. Adriani, Y. Akaike, Y. Asaoka, K. Asano, M.G. Bagliesi, G. Bigongiari, W.R. Binns, M. Bongi, J.H. Buckley, A. Cassese, G. Castellini, M.L. Cherry, G. Collazuol, K. Ebisawa, V. Di Felice, H. Fuke, T.G. Guzik, T. Hams, N. Hasebe, M. Hareyama, K. Hibino, M. Ichimura, K. Ioka, M.H. Israel, A. Javaid, E. Kamioka, K. Kasahara, Y. Katayose, J. Kataoka, R. Kataoka, N. Kawanaka, H. Kitamura, T. Kotani, H.S. Krawczynski, J.F. Krizmanic, A. Kubota, S. Kuramata, T. Lomtadze, P. Maestro, L. Marcelli, P.S. Marrocchesi, J.W. Mitchell, S. Miyake, K. Mizutani, H.M. Motz, A.A. Moiseev, K. Mori, M. Mori, N. Mori, K. Munakata, H. Murakami, Y.E. Nakagawa, S. Nakahira, J. Nishimura, S. Okuno, J.F. Ormes, S. Ozawa, F. Palma, P. Papini, B.F. Rauch, S. Ricciarini, T. Sakamoto, M. Sasaki, M. Shibata, Y. Shimizu, A. Shiomi, R. Sparvoli, P. Spillantini, I. Takahashi, M. Takayanagi, M. Takita, T. Tamura, N. Tateyama, T. Terasawa, H. Tomida, S. Torii, Y. Tunesada, Y. Uchihori, S. Ueno, E. Vannuccini, J.P. Wefel, K. Yamaoka, S. Yanagita, A. Yoshida, K. Yoshida, and T. Yuda (2014). Status and performance of the CALorimetric Electron Telescope (CALET) on the International Space Station, *Nucl. Phys. B Proceedings Supplements*, **256**, 225-232.

S. W. Barwick, E. C. Berg, D. Z. Besson, G. Binder, W. R. Binns, D. J. Boersma, R. G. Bose, D. L. Braun, J. H. Buckley, V. Bugaev, S. Buitink, K. Dookayka, P. F. Dowkontt, T. Duffin, S. Euler, L. Gerhardt, L. Gustafsson, A. Hallgren, J. C. Hanson, M. H. Israel, J. Kiryluk, S. R. Klein, S. Kleinfelder, H. Niederhausen, M. A. Olevitch, C. Persichelli, K. Ratzlaff, B. F. Rauch, C. Reed, M. Roumi, A. Samanta, G. E. Simburger, T. Stezelberger, J. Tatar, U. I. Uggerhoj, J. Walker, G. Yodh, and R. Young (2015). A first search for cosmogenic neutrinos with the ARIANNA Hexagonal Radio Array, *Astroparticle Physics*, **70**,12-26.

H. Schoorlemmer, K. Belov, A. Romero-Wolf, D. García-Fernández, V. Bugaev, S. A. Wissel, P. Allison, J. Alvarez-Muñiz, S. W. Barwick, J. J. Beatty, D. Z. Besson, W. R. Binns, W. R., Jr. Carvalho, C. Chen, P. Chen, J. M. Clem, A. Connolly, P. F. Dowkontt, M. A. DuVernois, R. C. Field, D. Goldstein, P. W. Gorham, C. Hast, T. Huege, C. L. Heber, S. Hoover, M. H. Israel, A. Javaid, J. Kowalski, J. Lam, J. G. Learned, J. T. Link, E. Lusczek, S. Matsuno, B. C. Mercurio, C. Miki, P. Miočinović, K. Mulrey, J. Nam, C. J. Naudet, J. Ng, R. J. Nichol, K. Palladino, B. F. Rauch, J. Roberts, K. Reil, B. Rotter, M. Rosen, L. Ruckman, D. Saltzberg, D. Seckel, D. Urdaneta, G. S. Varner, A. G. Vieregg, D. Walz, F. Wu, and E. Zas (2016). Energy and flux measurements of ultra-high energy cosmic rays observed during the first ANITA flight, *Astroparticle Physics*, **77**, 32-43.

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P. W. Gorham, J. Nam, A. Romero-Wolf, S. Hoover, P. Allison, O. Banerjee, J. J. Beatty, K. Belov, D. Z. Besson, W. R. Binns, V. Bugaev, P. Cao, C. Chen, P. Chen, J. M. Clem, A. Connolly, B. Dailey, C. Deaconu, L. Cremonesi, P. F. Dowkontt, M. A. Duvernois, R. C. Field, B. D. Fox, D. Goldstein, J. Gordon, C. Hast, C. L. Hebert, B. Hill, K. Hughes, R. Hupe, M. H. Israel, A. Javaid, J. Kowalski, J. Lam, J. G. Learned, K. M. Liewer, T. C. Liu, J. T. Link, E. Lusczek, S. Matsuno, B. C. Mercurio, C. Miki, P. Miočinović, M. Mottram, K. Mulrey, C. J. Naudet, J. Ng, R. J. Nichol, K. Palladino, B. F. Rauch, K. Reil, J. Roberts, M. Rosen, B. Rotter, J. Russell, L. Ruckman, D. Saltzberg, D. Seckel, H. Schoorlemmer, S. Stafford, J. Stockham, M. Stockham, B. Strutt, K. Tatem, G. S. Varner, A. G. Vieregg, D. Walz, S. A. Wissel, F. Wu, Anita Collaboration (2016). Characteristics of Four Upward-Pointing Cosmic-Ray-like Events Observed with ANITA, *Phys. Rev. Lett.*, **117**, Issue 7, id.071101.

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R. P. Murphy, M. Sasaki, W. R. Binns, T. J. Brandt, T. Hams, M. H. Israel, A. W. Labrador, J. T. Link, R. A. Mewaldt, and J. W. Mitchell (2016). Galactic Cosmic Ray Origins and OB Associations: Evidence from SuperTIGER Observations of Elements $_{26}$Fe through $_{40}$Zr, *Astrophys. J.*, **831**, Issue 2, article id. 148, 7 pp.

Conference Proceedings:

D. J. Lawrence, L. M. Barbier, J. J. Beatty, W. R. Binns, E. R. Christian, D. J. Crary, D. J. Ficenec, P. L. Hink, J. Klarmann, J. W. Mitchell, B. F. Rauch, R. E. Streitmatter, and C. J. Waddington: (1995). The Trans-Iron Galactic Element Recorder (TIGER) Experiment, *24th International Cosmic Ray Conference,* (Rome, Italy), **3** 681-684.

J.E. Floyd, L.T. Wolf, and B.F. Rauch: (2000). Zone Model Simulations with CFAST of HDR T52.11 Oil Fire Experiment in the Containment, *Proc. ICONE 8, 8th International Conference on Nuclear Engineering,* Baltimore, MD, April 2-6, paper ICONE-8487.

S. Geier, B. F. Rauch, L. M. Barbier, W. R. Binns, J. R. Cummings, G. A. de Nolfo, M. H. Israel, J. T. Link, R. A. Mewaldt, J. W. Mitchell, S. M. Schindler, L. M. Scott, E. C. Stone, R. E. Streitmatter, and C. J. Waddington (2005). Observations of the Ultra-Heavy Galactic Cosmic Ray Abundances with TIGER, *29th International Cosmic Ray Conference,* (Pune, India) **3**, 93-96.

G. A. de Nolfo, L. M. Barbier, W. R. Binns, J. R. Cummings, S. Geier, M. H. Israel, J. T. Link, R. A. Mewaldt, J. W. Mitchell, B. F. Rauch, S. M. Schindler, L. M. Scott, E.C. Stone, R. E. Streitmatter, C. J. Waddington, M. E. Wiedenbeck (2005). Co/Ni Ratio Between 0.8 and 5 GeV/nucleon from TIGER-2001, *29th International Cosmic Ray Conference,* (Pune, India) **3**, 61-64.

B. F. Rauch, L. M. Barbier, W. R. Binns, J. R. Cummings, G. A. de Nolfo, S. Geier, M. H. Israel, J. T. Link, R. A. Mewaldt, J. W. Mitchell, S. M. Schindler, L. M. Scott, E. C. Stone, R. E. Streitmatter, and C. J. Waddington (2006). Measurement of the Relative Abundances of the Ultra-Heavy Galactic Cosmic-Ray Abundances (30 =< Z =< 40) with TIGER, In J.P. Wefel, T. Stanev, and M.M. Shapiro (Eds.) *Proceedings of the International School of Cosmic Ray Astrophysics (ISCRA) 15th Course: Astrophysics at Ultra-High Energies,* Erice, Sicily, Italy, 20-27 June 2006.

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G. A. de Nolfo, L.M. Barbier, B.F. Rauch, S.M. Schindler, L.M. Scott, E.C. Stone, R.E. Streitmatter, C.J. Waddington, W.R. Binns, E.R. Christian, J.R. Cummings, S. Geier, M.H. Israel, J.T. Link, R.A. Mewaldt, and J.W. Mitchell (2007). Co/Ni Ratio Between ~0.8-5.0 GeV/nucleon from the TIGER 2001 Flight, *30th International Cosmic Ray Conference,* (Merida, Mexico) **2**, 43-46.

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P. Fuehrer, G. Healey, B. Rauch, D. Slater, and A. Ratkowski (2009). High-dimensional atmospheric radiance modeling for VNIR/SWIR HSI target detection, *Proceedings of the Military Sensing Symposium (MSS),* Orlando, FL.

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P. Fuehrer, G. Healey, B. Rauch, D. Slater, and A. Ratkowski (2009). Atmospheric sampling for VNIR/SWIR hyperspectral data analysis, *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series,* **7334**.

J. T. Link, L. M. Barbier, W. R. Binns, E. R. Christian, J. R. Cummings, S. Geier, M. H. Israel, K. Lodders, R. A. Mewaldt, J. W. Mitchell, G. A. deNolfo, B. F. Rauch, S. M. Schindler, L. M. Scott, R. E. Streitmatter, E. C. Stone, C. J. Waddington and M. E. Wiedenbeck (2009). Insights into the galactic cosmic-ray source from the TIGER experiment, *31st International Cosmic Ray Conference,* (Lodz, Poland).

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B. F. Rauch, W. R. Binns, M. H. Israel, P. S. Marrocchesi, Y. Shimizu, and S. Torii (2011). Capability of the CALET Experiment for Measuring Elemental Abundances of Galactic Cosmic Ray Nuclei Heavier than Nickel (Z=28), *32nd International Cosmic Ray Conference,* (Beijing, China), paper 0690, **6**, 355-358.

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T. Hams, W. R. Binns, R. G. Bose, D. L. Braun, E. R. Christian, W. M. Daniels, G. A. de Nolfo, P. F. Dowkontt, D. J. Hahne, T. Hams, M. H. Israel, A. W. Labrador, R. A. Mewaldt, J. W. Mitchell, P. R. Moore, R. P. Murphy, M. A. Olevitch, B. F. Rauch, F. San Sebastian, M. Sasaki, G. E. Simburger, E. C. Stone, C. J. Waddington, J. E. Ward, and M.E. Wiedenbeck (2011). Cherenkov Counter Development for the Super-TIGER Balloon Payload, *32nd International Cosmic Ray Conference,* (Beijing, China), paper 0831, **6**, 379-382.

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T. Niita and the CALET Collaboration (2013). CALET Calibration on ISS Orbit Using Cosmic Rays, *33rd International Cosmic Ray Conference,* (Rio de Janeiro, Brazil), paper 0435.

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Y. Akaike for the CALET Collaboration (2013). CALET observational performance expected by CERN beam test, *33rd International Cosmic Ray Conference,* (Rio de Janeiro, Brazil), paper 0726.

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