**Dr. Joseph M. Katich** May 2018
Cooperative Institute for Research in Environmental Sciences (CIRES) 303 497 5269
National Oceanic and Atmospheric Administration (NOAA) Joseph.M.Katich@noaa.gov
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## Highlighted Scientific Expertise

- In situ measurements of black carbon throughout the troposphere and lower stratosphere using airborne instruments
- Laboratory measurement of black carbon concentrations in snow and ice samples from around the globe
- Sophisticated analyses of large datasets acquired in laboratory and via airborne measurements
- Calibration, testing and maintenance of complex scientific systems in the laboratory and field
- Oral and written communication of scientific results to the scientific community

## Education

Ph.D. Physics, 2010, College of William and Mary, Williamsburg, VA
M.S. Physics, 2006, College of William and Mary, Williamsburg, VA
B.S. Physics, 2003, Westminster College, New Wilmington, PA

## Employment History

2018 - Present **Research Scientist II**, CIRES, University of Colorado/NOAA Earth System Research Laboratory, Chemical Sciences Division, Boulder, CO
- Leading measurements of black carbon-containing particles in the remote atmosphere and areas strongly influenced by biomass-burning

2015 - 2018 **Research Scientist I**, CIRES, University of Colorado/NOAA Earth System Research Laboratory, Chemical Sciences Division, Boulder, CO
- Quantifying black carbon particulate concentrations and microphysical state in atmosphere and snow using the NOAA Single Particle Soot Photometer (SP2)

2010 – 2015 **Research Associate**, University of Colorado, Boulder, CO
- Conducting research in the field of nuclear physics. Led the design, construction and deployment of a novel charged particle detector at Fermi National Accelerator Facility.

2005 – 2010 **Research Assistant**, College of William and Mary, Williamsburg, VA
- Performing research in the structure of protons and neutrons at Thomas Jefferson National Accelerator Facility, with a focus on the development of a polarized neutron target

## Field Campaigns

- May 2018 NASA Atmospheric Tomography 4 (Global Scale, DC-8)
- Oct. 2017 NASA Atmospheric Tomography 3 (Global Scale, DC-8)
- Feb. 2017 NASA Atmospheric Tomography 2 (Global Scale, DC-8)
- Aug. 2016 NASA Atmospheric Tomography 1 (Global Scale, DC-8)
- Sep. 2015 Fifth International Ice Nucleation Workshop, (Storm Peak Laboratory. CO)

## Collaborative Activities

- Support the modeling community with BC data and interpretation: vertical profiles of BC mass mixing ratios from NASA ATom
  - Björn Samset, CICERO Senter for Klimaforsking, Oslo, Norway
  - Marianne Lund, CICERO Senter for Klimaforsking, Oslo, Norway
- Perform as well as direct measurements and analysis of black carbon concentrations in snow samples from around the globe
  - Carl Schmitt, NCAR
  - Alia Kahn, University of Colorado
  - Ethan Emerson, Colorado State University

## Professional Service

- Reviewer for journals and funding agencies, including *Atmosphere, Atmospheric Environment, Atmospheric Measurement Techniques, Aerosol Science and Technology and DOE/ARM Climate Research Facility*
- Frequent participant in multiple outreach programs at NOAA, 2015-present
- University of Colorado Graduate Admissions Committee, 2012-2015
- Thomas Jefferson National Accelerator Facility tour guide, 2006-2009

## Honors

- NASA Group Achievement Award, KORUS-AQ Team, 2017
- Gold Star recognition for supporting Earth Explorers program, 2017
- DOE Graduate Fellowship Award, 2009
- SURA/JSA Fellowship Recipient, 2007-2008
- 1st Place, Jefferson Laboratory Poster Competition, 2007
- Sigma Pi Sigma National Honor Society for Physics, 2003

## Invited Talks and Seminars

"*SeaQuest at Fermilab: An Investigation of the Structure of the Proton*", National Oceanic and Atmospheric Administration, Boulder, CO, November 2014

"*Nuclear Physics at Jefferson Lab*", University of Northern Colorado, Greeley, CO, February 2011

"*Measurement of the Target Single Spin Asymmetry in the Inclusive DIS n(e,e') Reaction from $^3He$*", University of Colorado, Boulder, CO, May 2010

"*Measurement of the Target Single Spin Asymmetry in the Inclusive DIS n(e,e') Reaction from $^3He$*", Thomas Jefferson National Accelerator Facility, Newport News, VA, April 2010

## Select Contributed Talks, Seminars and Posters

"*First Comparison of Remote Vertical Profiles of Refractory Black Carbon between the Atlantic and Pacific Basins on Global Scales*", AGU 2016, San Francisco, CA, December 2016.

"*Measurements of BC-Containing Aerosol and Ice Nucleation Active Residuals in Colorado*", AGU 2015, San Francisco, CA, December 2015.

"*Measurement of the Target Single Spin Asymmetry, $A^n_y$, in the Inclusive DIS n(e,e') Reaction from a Vertically Polarized $^3He$ Target*", APS April 2009, Denver, CO, May 2009.

"*A New $^3He$ Target for Jefferson Lab*", The 18th International Symposium on Spin Physics, Charlottesville, VA, October 2008.

"*A Measurement of the Target Single Spin Asymmetry in Quasi-elastic $^3He(e,e')$*", Thomas Jefferson National Accelerator Facility Poster Competition, Newport News, VA, June 2007.

"*A Measurement of the Target Single Spin Asymmetry in Quasi-elastic $^3He(e,e')$*", Gordon Research Conference on Photonuclear Reactions, Tilton, NH, August 2006.

## Scientific Publications

J. M. Katich, A.E. Perring, J. P. Schwarz, "Optimized detection of particulates from liquid samples in the aerosol phase: Focus on black carbon", Aerosol. Sci. & Tech. 51, (2017) 5, 543-553.

M. Roesch, S. Garimella, C. Roesch, M. A. Zawadowicz, J. M. Katich, K. D. Froyd, and D. J. Cziczo, "Separation of ice crystals form interstitial aerosol", in preparation for submission late 2017.

X. Yan et al. "First measurement of unpolarised SIDIS cross section and cross section ratios from a $^3$He target", Phys. Rev. C. 95, (2017) 035209

D. Flay et al. "Measurements of $d^2_n$ and $A^n_1$ : Probing the neutron spin structure", Phys. Rev. D. 94, (2016) 052003

J.P. Schwarz, Holloway, J.S., Katich, J.M., McKeen, S., Kort, E.A., Smith, M.L., Ryerson, T.B., Sweeney, C., Peischl, J., 2015. Black carbon emissions from the Bakken oil and gas development region. Environ. Sci. Technol. Lett. 2, (2015) 281-285.

Y. Zhang et al. "Measurement of the Target-Normal Single-Spin Asymmetry in Quasi-Elastic Scattering from the Reaction $^3\text{He}^{\uparrow}$(e,e')", Phys. Rev. Lett. 115, (2015) 172502

D. S. Parno et al. “Precision Measurements of $A^n_1$ in the Deep Inelastic Regime”, arXiv:1406.1207 Phys. Rev. B. 744, 309-314, (2015) 055209

M. Mihovilovic˘ et al. “Measurement of double-polarizable asymmetries in the quasi-elastic $^3$He($\vec{}$e, e′ d) process”, Phys. Rev. Lett. 113 (2014) 232505

J. Katich et al. “Measurement of the Target-Normal Single Spin Asymmetry in Deep-Inelastic Scattering from the Reaction $^3$He(e,e’)X”, Phys. Rev. Lett. 113 (2014) 022502

M. Posik et al. “A Precision Measurement of the Neutron Twist-3 Matrix Element $d_2$: Probing Color Forces”, Phys. Rev. Lett. 113 (2014) 022002

Y. X Zhao et al. “Single Spin Asymmetries in Charged Kaon Production from Semi-Inclusive Deep Inelastic Scattering on a Transversely Polarized $^3$He Target”, Phys. Rev. C. 90, (2014) 055201

Y. Zhang et al. “Measurement of pretzelosity asymmetry of charged pion production in Semi-Inclusive Deep Inelastic Scattering on a polarized $^3$He Target”, Phys. Rev. C. 90, (2014) 055209

K. Allada et al. “Single Spin Asymmetries of inclusive hadrons produced in electron scattering from a transversely polarized $^3$He target”, Phys. Rev. C. 89, (2014) 042201(R)

S. Abrahamyan et al. “New Measurements of the Transverse Beam Asymmetry for Elastic Electron Scattering from Selected Nuclei”, Phys. Rev. Lett. 109 (2012) 192501

J. Huang et al. “Beam-Target Double Spin Asymmetry $A_{LT}$ in Charged Pion Production from Deep Inelastic Scattering on a Transversely Polarized $^3$He Target at $1.4 < Q^2 < 2.7$ GeV $^2$”, Phys. Rev. Lett. 108 (2012) 052001

T. Averett, J. Katich, B. Zhao et al. “Two Photon Exchange in Quasi-elastic and Deep-inelastic Scattering”, AIP Conf. Proc. 1374 (2011) 254-257

X. Qian et al. “Single Spin Asymmetries in Charged Pion Production from Semi-Inclusive Deep Inelastic Scattering on a Transversely Polarized $^3$He Target”, Phys. Rev. Lett. 107 (2011) 072003

X. Zhan et al. “High Precision Measurement of the Proton Elastic Form Factor Ratio $\mu_p G_E/G_M$ at low $Q^2$”, Phys. Rev. B 705 (2011) 59-64

S. Riordan et al. “Measurement of the Electric Form Factor of the Neutron up to $Q^2 = 3.4$ GeV $^2$ using the Reaction $^3\vec{\text{He}}(\vec{\text{e}},\text{e'n})$pp, Phys. Rev. Lett. 105 (2010) 262302

J. Katich. “A New $^3$He Target for Jefferson Lab”, AIP Conf. Proc. 1149 (2009) 899-902

A. Acha et al. “Precision Measurements of the Nucleon Strange Form Factor at $Q^2 \sim 0.1$ GeV $^2$”, Phys. Rev. Lett. 98 (2007) 032301