

# ERIC ADAM NUSSBAUMER

e-mail: [ebaumer@gmail.com](mailto:ebaumer@gmail.com)

Ph: (202)213-2712

## EDUCATION

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**Ph.D. (Candidate) Atmospheric and Oceanic Sciences** Present

*University of Maryland – College Park, MD*

- Cumulative GPA 4.00/4.00
- Graduation Date: March 14<sup>th</sup>, 2012

**Masters of Science (Earth and Planetary Sciences)** 2008

*Johns Hopkins University – Baltimore, MD*

- Cumulative GPA 3.88/4.00

**Masters of Science (Aerospace Engineering)** 2001

*University of Colorado – Boulder, CO*

- Cumulative GPA 3.78/4.00

**Bachelors of Science (Aerospace Engineering)** 1999

*University of Colorado – Boulder, CO*

- Cumulative GPA 3.86/4.00

### Academic Honors and Awards

- Dean's list
- Tau Beta Pi (Engineering Honor Society)
- Sigma Gamma Tau (Aerospace Honor Society)
- 2 time recipient of Astronaut Scholarship Award – University of Colorado
- Recipient of Bromery Fellowship – Johns Hopkins University
- Recipient of Graduate School Block Grant Fellowship -- University of Maryland

## PROFESSIONAL EXPERIENCE

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**University of Maryland – College Park, MD** 2008 – Present

*Graduate Research Assistant*

- Developing radiative transfer methodologies to infer surface longwave flux, including developing neural networks for radiative transfer model approximation and estimation of cloud vertical structure based on a combination of satellite and re-analysis data. Develop algorithms to spatially and temporally co-locate satellite observations. Application of surface longwave net flux to the study of the effect of the cloud radiative forcing on Arctic Sea Ice melt. Advisor: Rachel T. Pinker

**Visiting Scholar – Columbia University, NY** 2010 – 2011

- Visiting scholar at the Department of Applied Physics and Applied Mathematics. Host professor: Lorenzo Polvani.

**Ball Aerospace & Technologies Corporation** March 2005 – June 2006

*Engineer II – Mission Systems Department*

- Fulfill the role of data analysis for detector electronics on DoD mission. Develop algorithms and Matlab code to process data to evaluate the performance of detector electronics.

**The Aerospace Corporation – El Segundo, CA** Sep 2002 – March 2005

*Member of the Technical Staff – Vehicle Concepts Department*

- Systems engineer for a variety of DoD and NASA missions. Lead multidisciplinary teams in the real-time conceptual development of spacecraft for mission such as: Space Tracking and Surveillance System (STSS), MiDSTEP and Sub-GEO Observer. Develop multiple 1<sup>st</sup> order designs of Hyper-Spectral Imaging (HSI) payloads for various DoD missions. Develop infrastructure to allow multi Conceptual Design Centers (CDC) located through out the United States to simultaneously participate in real-time

conceptual design. Responsible for the development and continued support of concurrent engineering design centers at various educational institutions such as Air Force Institute of Technology (AFIT), Naval Post Graduate School (NPS), and the NASA/AMES Girvan Institute. Supported Jet Propulsion Lab's (JPL) Team I as systems engineer for NASA's AstroMETric Explorer (AMEX). Co-developed a tool to estimate the performance of hyper-spectral and multi-spectral imagers under various environmental conditions (see publications). Developed concept-level remote sensing payloads, identified critical technologies, assessed development needs, and investigated payload integration and test issues on spacecraft bus for Jupiter Icy Moons Orbiter (JIMO). Developed several spacecraft conceptual designs to rehost the SM4 like instruments for the Hubble Space Telescope (HST) Servicing Alternative of Analysis (AoA) study. Developed a list of critical technologies for the NRO to help guide funding.

**University of Colorado – Boulder, CO**

2001 - 2002

*Research Assistant*

- Research assistant to Dr. Brian Argrow
- DARPA funded project, Quiet Supersonic Platform (QSP)
- Conducted study of linear theory associated with sonic boom and propagation of pressure signature through atmosphere

**Aerosonde North America – Boulder, CO**

2000 - 2001

*Internship*

- Researched low power and low weight active de-icing system/sensor for the Aerosonde Unmanned Aerial Vehicle (UAV)

**Colorado Center for Astrodynamics Research – Boulder, CO**

1998 - 1999

*Internship*

- Processed altimetry data from the ERS and Topex/Poseidon satellite
- Created an outreach program for K-12 schools

**PROFESSIONAL AWARDS AND RECOGNITIONS**

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- October 2011 – Winner of Outstanding Presentation at the World Climate Research Programme Conference, Denver, Colorado, 2011
- July 2005 – Letter of Commendation leading the Space Tracking and Surveillance System (STSS) Block 12 space vehicle study at the Aerospace Corporation. Letter from Colonel Christopher Pelc, System Program Director for STSS
- July 2004 – Achievement Award for developing and deploying Concept Design Center (CDC) concurrent engineering tools to educational institutions
- September 2004 – Letter of Commendation for participation in the Hubble Space Telescope (HST) Servicing Analysis of Alternatives (AoA) Study. Letter from the General Manager of the Civil and Commercial Division of the Aerospace Corporation
- April 2004 – Performance Recognition Award for implementation of the Integrated Data Exchange Architecture (IDEA) database to support conceptual design in the Concept Design Center (CDC)
- August 2003 – Employee Spot Award for sizing of Hyper-Spectral Imaging (HSI) payloads and design of supporting spacecraft for the Air Force

## PUBLICATIONS AND PRESENTATIONS

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- **Nussbaumer, E.A.** Invited talk to the Environmental Protection Agency (EPA) Climate Change Region 8 office. The role of surface radiation in Arctic sea ice anomalies from 2003-2007. Denver, Colorado November 2011.
- **Nussbaumer, E.A.**, Pinker, R.T. (2011) The Role of Shortwave and Longwave Radiation in Arctic Sea Ice Anomalies from 2003-2007. *J. Geophys. Res. Letts.* [To be submitted]
- **Nussbaumer, E.A.**, Pinker, R.T. (2011) Estimating Surface Longwave Radiative Fluxes from Satellites utilizing Artificial Neural Network. *J. Geophys. Res-Atmos.* [Accepted]
- **Nussbaumer, E.A.**, and R.T Pinker (2011) Estimating surface longwave radiative fluxes at global scale. *Q. J. Roy. Meteor. Soc.*, DOI: 10.1002/qj.974.
- **Nussbaumer, E.A.**, and R.T Pinker, Estimating Global Surface Longwave Radiative Fluxes Fluxes Utilizing Artificial Neural Networks. Poster session presented at the World Climate Research Programme Conference, Denver, Colorado, 2011.
- Pinker, R.T., A. Bentamy, Y.-T. Ma, **E.A. Nussbaumer**, A. Santorelli, A. M. Mestas-Nunez, K. B. Katsaros, W.M. Drennan, F.J. Kelly, and J. A. Carton. An air-sea flux dataset based on satellite observations. Presentation at Pan Ocean Remote Sensing Conference, Keelung, Taiwan, 2010.
- Lomheim, T.S., **E.A. Nussbaumer**, J.A. Lang, D.W. Warren, N. Carballo (2004). Parametric Methodologies and Tools for First-order Hyperspectral Imaging Sensor System Design, *Imagining Spectrometry X*, Volume 5546, pg 1-28, 2004
- Lomheim, T.S., **E.A. Nussbaumer**, J.A. Lang, Presentation at SPIE's annual International Symposium on Optical Science and Technology, Denver, CO. August 2004
- **Nussbaumer, E.A.**, Presentation to the Vice President of the Aerospace Corporation. Parametric Methodologies and Tools for First-order Hyperspectral Imaging Sensor System Design. El Segundo, CA. June 2004

## TEACHING EXPERIENCE

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- Taught classes for the Aerospace Institute, El Segundo, California regarding spacecraft conceptual design and concurrent engineering
- Taught classes regarding spacecraft conceptual design, concurrent engineering, and infrared payloads in a week long course for employees of the National Reconnaissance Office (NRO)
- Taught classes regarding spacecraft conceptual design and concurrent engineering for students at the Naval Postgraduate School (NPS). Consult on students year long project to develop a conceptual design of a spacecraft through Preliminary Design Review (PDR)
- Teaching assistant for the following classes:
  - University of Colorado, Boulder: Introduction to Engineering Computing, Aircraft Design, and Aerospace Materials

- University of Maryland, College Park: Causes and Implications of Global Change, The Atmosphere

#### SKILLS, INTERESTS AND PROFESSIONAL AFFILIATIONS

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- Computer Skills
  - Programming Languages: Matlab, Python, Fortran (77,90,95,2003), GrADS
  - Software Packages: Excel/VBA, Matlab, Mathematica, Solidworks, PostgreSQL, Access, Satellite Tool Kit (STK), Satellite Orbit Analysis Program (SOAP)
- Professional Society Memberships: AIAA, SPIE, AGU
- Volunteer to mentor high school students in summer cooperative work-study and research program at University of Maryland. The Research and Engineering Apprenticeship Program (REAP) encourages economically and socially disadvantaged high school students to pursue careers in math, science, and technology. This program is under the auspice of the Academy of Applied Science.
- Volunteered teaching science in Baltimore inner-city elementary school through the KidsGrow program, which is part of the Parks & People Foundation
- Volunteered at Lenox Middle School Los Angeles, California teaching math and science to grades 6<sup>th</sup> – 8<sup>th</sup>
- Volunteered at the Boulder Colorado Youth Recreation Program. Mentored youths of low-income housing ranging in age of 5-12 years
- Volunteered at the Boulder Colorado Broadway Youth Shelter. Mentored teenagers transitioning between juvenile hall and home
- Volunteered at the Denver SPOT at risk youth center. Mentored at risk youths in basic computer skills for ages 6-18 years
- Coach for the Johns Hopkins University cycling team
- Former member of the University of Colorado Cycling Team. Participated in the 2001 NCAA Nationals, placed 2<sup>nd</sup> overall
- Former member of the Kings North International Cycling Team, Belgium. Raced on a multi-national cycling team in Belgium, Holland and France

#### CLEARANCE

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- Secret clearance – Not active