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WORCESTER
STATE
UNIVERSITY

Education

- 2011 📌 **Ph.D., Physics, University At Albany, State University of New York (SUNY)**
- 2008 📌 **M.S. Physics, SUNY Albany, NY**
- 2005 📌 **M.Sc. Physics, Tribhuvan University, Kathmandu, Nepal**

Employment History

- 2017 – 📌 **Worcester State University**, Assistant Professor, Department of Earth Environment and Physics.
- 2014 – 2017 📌 **NASA Jet Propulsion Laboratory/Caltech**, Postdoctoral Research Scientist.
- 2013 – 2014 📌 **NOAA-CREST/The City College of New York**, Postdoctoral Researcher.
- Fall 2012 📌 **University of Texas at Dallas (UT Dallas)**, Senior Lecturer, Physics.
- 2011 – 2013 📌 **William B. Hansen Center for Space Sciences, UT Dallas**, Postdoctoral Research Associate.
- 2006 – 2010 📌 **SUNY, Albany**, Graduate Research/Teaching Assistant, Department of Physics, University at Albany, SUNY.
- 2005 – 2006 📌 **Himalayan White House International College** Faculty of Physics, Kathmandu, Nepal.

Teaching Experience

- Assistant Professor 📌 **Worcester State University, Worcester, MA**
 - Spring 2018: Physics-II (PY 222)
 - Spring 2018: Environmental Science (EV 150)
 - Fall 2017: Physics-I (PY 221)
 - Fall 2017: Environmental Science (EV 150)

- Senior Lecturer 📌 **University of Texas at Dallas, Fall 2012**
 - Numerical Methods in Physics and Computational Techniques (PHYS 3330)
 - Mechanics (PHYS 2325)

- Fulltime Faculty 📌 **Himalayan White House International College, Kathmandu, Nepal (June 2005–July 2006).**

- Guest Lecturer 📌 **Department of Physics, University at Albany, SUNY.**
 - Spring 2011: Physics 5V49-008: Special Topics in Physics
 - Spring 2010: Computational Physics, Graduate Level APHY 577
 - Fall 2009: Star Systems, APHY 112
 - Fall 2009: Quantum Mechanics, Graduate Level APHY 547
 - Spring 2009: Computational Physics, Graduate Level, APHY 577
 - Spring 2009: Electricity and magnetism, APHY 151

Teaching Experience (continued)

- Teaching Assistant ■ Department of Physics, University at Albany, SUNY, 2006-2010.
- Introductory Physics Laboratory Courses (APHY 105, APHY 106, APHY 145)
 - Advanced Physics Laboratory Course (APHY 245)
 - Computational Physics (APHY 660)
 - Bayesian Data Analysis and Signal Processing (APHY 451/551, ICSI 451/551)
 - Star Systems (APHY 112)
- Part-time Teacher ■ June 2005-July 2006, Central Department of Physics, Tribhuvan University, Kirtipur, Nepal.
- Mentoring ■ Mentored PhD, undergraduates and high school students.

Funding

Teaching/Research

- \$1000 ■ **WSU-OERI Spring 2018**, Worcester State University-Open Educational Resources Initiative (OERI).
- \$TBD ■ **NASA ROSES-2016**, "Maximizing Utility of Remote Sensing Data for Water Quality Monitoring and Resources Management in California's Water Systems", NASA JPL/Caltech. PI: Cristine Lee, NASA JPL/Caltech.
- \$1000 ■ **Travel Grant, CUNY Postdoctoral Travel Award, 2014**, CCNY, NY.
- \$375 ■ **Travel Grant, Graduate Student Organization, Summer 2010**, SUNY, Albany, NY.
- \$440 ■ **Benevolent Association Research Grant**,, SUNY, Albany, NY.

Organizational

- \$375 ■ **Graduate Student Organization, Summer 2010**,, N.K. Malakar, Secretary, Nepali Student-RGSO: Academic Year 2009/2010,SUNY, Albany, NY.
- \$750 ■ **Recognized Graduate Student Organization (RGSO) Grant**,, N.K. Malakar, President, Physics-RGSO: Academic Year 2007/2008, Also the winner of the "Most educationally enriching RGSO" award. SUNY, Albany, NY.

Honors & Awards

- JPL Recognition ■ Recognition by JPL Community Service and Volunteerism Recognition Event for tutoring in Lakeview Community Foundation in STARS program.
- Full support ■ Travel and accomodation award to present "Maximum Joint Entropy and Information-Based Collaboration of Automated Learning Machines", at 31st International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering (MaxEnt), 2011, Waterloo, Canada.
- Full support to present "Entropy-based search algorithm for experimental design", at MaxEnt 2010, Chamonix, France.

Honors & Awards (continued)

- Full support to present “The Spatial Sensitivity Function of a Light Sensor” at MaxEnt 2009, Oxford, Mississippi, USA.
- Full Support to present “The Field of a Permanent magnet: A Challenge for Competing Models” at MaxEnt 2008, Sao Paulo, Brazil.
- Outstanding Award ■ Outstanding performance in Comprehensive Examination 2007, Physics Department, University at Albany, SUNY.
- ESA ■ Selected and participated as a representative student of Tribhuvan University for International Astronautical Congress 2003 (supported by European Space Agency), Bremen, Germany.
- Scholarship ■ Scholarship Award for MSc. 1st and 2nd year, Tribhuvan University, Kirtipur, Nepal.

Publications

Peer Reviewed Articles

- ① Hulley, G., **Malakar, N.**, Islam, T., & Freepartner, R. (2017). NASA’s MODIS and VIIRS land surface temperature and emissivity products: a long-term and consistent earth system data record. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (J-STARS)*, (DOI: 10.1109/JSTARS.2017.2779330).
- ② Islam, T., Hulley, G. C., **Malakar, N.**, Radocinski, R. G., Guillevic, P. C., & Hook, S. J. (2017). A physics-based algorithm for the simultaneous retrieval of land surface temperature and emissivity from VIIRS thermal infrared data. *IEEE Transactions on Geoscience and Remote Sensing*, 55(1), 563–576.
- ③ Hulley, G. C., Duren, R. M., Hopkins, F. M., Hook, S. J., Johnson, W. R., Eng, B. T., ..., **Malakar, N.** et al. (2016). High spatial resolution imaging of methane and other trace gases with the airborne hyperspectral thermal emission spectrometer (HyTES). *Atmospheric Measurement Techniques*, 9(doi:10.5194/amt-9-2393-2016), 2393–2408.
- ④ **Malakar, N.** & Hulley, G. C. (2016a). A water vapor scaling model for improved land surface temperature and emissivity separation of MODIS thermal infrared data. *Remote Sensing of Environment*, 182, 252–264.
- ⑤ Hulley, G. C., Hook, S. J., Abbott, E., **Malakar, N.**, Islam, T., & Abrams, M. (2015). The ASTER global emissivity dataset (ASTER GED): mapping earth’s emissivity at 100 meter spatial scale. *Geophysical Research Letters*, 42(DOI: 10.1002/2015GL065564).
- ⑥ Knuth, K. H., Habeck, M., **Malakar, N.**, Mubeen, A. M., & Placek, B. (2015). Bayesian evidence and model selection. *Digital Signal Processing: Special Issue in Honor of William J. (Bill) Fitzgerald*, 47(doi:10.1016/j.dsp.2015.06.012), 50–67.
- ⑦ **Malakar, N.**, Gross, B., Chowdhury, N., & Moshary, F. (2015). Impacts of surface albedo models on high-resolution AOD retrieval. *SPIE Remote Sensing*, 96400Q.
- ⑧ Gencaga, D., **Malakar, N.**, & Lary, D. (2014). Survey on the estimation of mutual information methods as a measure of dependency versus correlation analysis. *AIP*, 1636(80).
- ⑨ Lary, D., Faruque, F., **Malakar, N.**, Moore, A., Roscoe, B., Adams, Z., & Eggelston, Y. (2014). Estimating the global abundance of ground level particulate matter (PM2.5) since 1997. *Geospatial Health*, 9(1), 1–40.

- ⑩ Lary, D. J., Faruque, F. S., **Malakar, N.**, Moore, A., Roscoe, B., Adams, Z. L., & Egelston, Y. (2014). Estimating the global abundance of ground level presence of particulate matter (PM_{2.5}). *Geospatial health*, 8(3), 611–630.
- ⑪ Lary, D. J., Faruque, F., **Malakar, N.**, Moore, A., Roscoe, B., Adams, Z., & Egelston, Y. (2014). Estimating the global abundance of ground level presence of microscopic particulate matter. *Geospat Health*, 8, S611–S630.
- ⑫ Atia, A. A., Picon, A., **Malakar, N.**, Gross, B., & Moshary, F. (2013). Ingesting MODIS land surface classification into aod retrievals. *SPIE Remote Sensing*, 888707.
- ⑬ Cordero, L., **Malakar, N.**, Wu, Y., Gross, B., Moshary, F., & Ku, M. (2013). Assessing satellite based PM_{2.5} estimates against CMAQ model forecasts. *SPIE Remote Sensing*, 88900U.
- ⑭ **Malakar, N.**, Cordero, L., Wu, Y., Gross, B., & Fred, M. (2013). Assessing surface PM_{2.5} estimates using data fusion of active and passive remote sensing methods. *British Journal of Environment and Climate Change*, 3(4), 547–565.
- ⑮ **Malakar, N.**, Gladkov, D., & Knuth, K. H. (2013). Modeling a sensor to improve its efficacy. *Journal of Sensors*. doi:<http://dx.doi.org/10.1155/2013/481054>
- ⑯ **Malakar, N.**, Lary, D., Gencaga, D., Albayrak, A., & Wei, J. (2013). Towards identification of relevant variables in the observed aerosol optical depth bias between modis and AERONET observations. *AIP*.
- ⑰ Stoneback, R., **Malakar, N.**, Lary, D., & Heelis, R. (2013). Specifying the equatorial ionosphere using CINDI on C/NOFS, COSMIC, and data interpolating empirical orthogonal functions. *Journal of Geophysical Research: Space Physics*, 118(10), 6706–6722.
- ⑱ **Malakar, N.**, Knuth, K., & Lary, D. (2012). Maximum joint entropy and information-based collaboration of automated learning machines. *AIP*, 1443, 230–237.
- ⑲ **Malakar, N.**, Lary, D. J., Moore, A., Gencaga, D., Roscoe, B., Albayrak, A., & Wei, J. (2012). Estimation and bias correction of aerosol abundance using data-driven machine learning and remote sensing. *2012 Conference on Intelligent Data Understanding (CIDU)*, 24–30.
- ⑳ **Malakar, N.** & Knuth, K. H. (2010). Entropy-based search algorithm for experimental design. *AIP*, 1305, 157–164.
- ㉑ **Malakar, N.**, Mesiti, A., & Knuth, K. (2009). The spatial sensitivity function of a light sensor. *AIP*, 352–359.

Conferences

- ① Hulley, G., **Malakar, N.**, & Luvall, J. (2017). A spatiotemporal investigation of heat wave characteristics and trends in los angeles. In *Hyspiri 2017* (<https://hyspiri.jpl.nasa.gov/documents/2017-workshop/>).
- ② **Malakar, N.** & Hulley, G. (2017). A case study of trends and spatial patterns of land surface temperatures over the greater los angeles, CA and phoenix, AZ using new MODIS LST product (MOD21). In *EGU general assembly conference abstracts* (Vol. 19, p. 3059).
- ③ Hulley, G. C. & **Malakar, N.** (2016). A spatio-temporal analysis of heatwave climatology in three major US cities. In *AGU 2016: gc51d-1191*.
- ④ **Malakar, N.** & Hulley, G. C. (2016b). Investigating warming trends and spatial patterns of land surface temperatures over the greater los angeles area using new modis LST product. In *AGU 2016: gc54c-05*.

- ⑤ Hulley, G., Islam, T., **Malakar, N.**, & Hook, S. (2015). MODIS and VIIRS land surface temperature and emissivity: a consistent and high quality continuity data record. In *AGU 2015*.
- ⑥ Islam, T., **Malakar, N.**, Hulley, G., & Hook, S. (2015). Developing NASA's VIIRS LST and emissivity EDRs using a physics based temperature emissivity separation (TES) algorithm. In *AGU 2015*.
- ⑦ **Malakar, N.** & Hulley, G. (2015). Validation and assessment of heritage and new MODIS land surface temperature and emissivity products for the creation of unified earth system data records. In *AGU 2015*.
- ⑧ **Malakar, N.**, Hulley, G., Hook, S., & Vance, N. (2015). Simulated ECOSTRESS L2 products from the HypsIRI airborne campaign. In *2015 hypsiri science and applications workshop*.
- ⑨ Nazmi, C., **Malakar, N.**, Cordero, L., & Gross, B. (2015). Analysis of new york city traffic data, land use, emissions and high resolution local meteorology for the prediction of neighborhood scale intra-urban PM2.5. In *AMS annual meeting 2015, sixth conference on environment and health, at phoenix, arizona*.
- ⑩ Cordero, L., **Malakar, N.**, Vidal, D., Latto, R., Gross, B., Moshary, F., & Ahmed, S. (2014). A regional NN estimator of PM2.5 using satellite AOD and WRF meteorology measurements. In *AMS 2014, Atlanta, GA, USA*.
- ⑪ Gross, B., **Malakar, N.**, Atia, A., Moshary, F., Ahmed, S., & Oo, M. (2014). Bias correction of MODIS AOD using DragonNET to obtain improved estimation of PM2. 5. In *AGU fall meeting* (Vol. 1, p. 3024).
- ⑫ **Malakar, N.**, Atia, A., Gross, B., Moshary, F., Ahmed, S., Lary, & D. (2014). Regional estimates of ground level aerosol using satellite remote sensing and machine-learning. In *AMS 2014*.
- ⑬ **Malakar, N.**, Bailey, M., Latto, R., Ekwedike, E., Gross, B., Gonzalez, J., ... Hulley, G. (2014). Ingesting land surface temperature differences to improve downwelling solar radiation using artificial neural network: a case study. In *AGU fall meeting* (Vol. 1, p. 0460).
- ⑭ **Malakar, N.**, Gross, B., Gonzalez, J. E., Yang, P., & Moshary, F. (2014). Use of NN based approaches to create high resolution climate meteorological forecasts. In *AMS 2014, atlanta, GA, USA*.
- ⑮ Cordero, L., **Malakar, N.**, Wu, Y., Gross, B., & Moshary, F. (2013). Assessment of PM2. 5 retrievals using a combination of satellite aod and WRF] PBL heights in comparison to WRF/CMAQ bias corrected outputs. In *2013 cmas conference, nc, usa*.
- ⑯ **Malakar, N.**, Cordero, L., Wu, Y., Gross, B., & Ku, M. (2013). Injection of meteorological factors into satellite estimates of surface PM2.5. In *2013 emep conference* (www.nyserda.ny.gov/emep-2013).
- ⑰ **Malakar, N.**, Oo, M., Atia, A., Gross, B., & Moshary, F. (2013). Bias correction of high resolution MODIS aerosol optical depth in urban areas using the dragon AERONET network. In *AGU 2013 oral presentation in a31k (swirl_da)*.
- ⑱ **Malakar, N.**, Lary, D., Allee, R., Gould, R., & Ko, D. (2012). Towards automated ecosystem-based management: a case study of northern gulf of mexico water. In *AGU fall meeting* (Vol. 1, p. 05).

NASA Science Product Documents

- ① Hulley, G., Hook, S., Johnson, W., Guillevic, P., & **Malakar, N.** (2016). *Hyperspectral thermal emission spectrometer (HyTES) level-2 land surface temperature and emissivity algorithm theoretical basis document*.

- ② Hulley, G., **Malakar, N.**, Hughes, T., Islam, T., & Hook, S. (2016a). *MODIS MOD21 land surface temperature and emissivity algorithm theoretical basis document*. JPL Publication 12-17.
- ③ Hulley, G., **Malakar, N.**, Hughes, T., Islam, T., & Hook, S. (2016b). *MODIS MOD21 land surface temperature and emissivity users guide collection 6*. JPL Publication 258720.
- ④ Hulley, G., Islam, T., **Malakar, N.**, Freepartner, R., & Simon, H. (2016). *VIIRS land surface temperature and emissivity algorithm theoretical basis document (ATBD)*. NASA Jet Propulsion Laboratory, California Institute of Technology.

Services

Panel	<ul style="list-style-type: none"> ■ NASA-NSPIRES Review Panel, 2017. ■ NASA-Big Data Early Career Faculty, 2017.
Committee	■ International Conference on Mountains in the Changing World, Scientific Committee, 2016, 2017
Journal Reviewer	■ IEEE-TGRS, JGR, RSE, MDPI-Remote Sensing, MDPI-Sensors, MDPI-Sustainability, MDPI-Atmosphere, Elsevier Digital Signal Processing, Intl. J. Remote Sensing.
Project Lead	■ Sample collection from Algodones Dunes, JPL, Spring 2016.
Editor	■ Special Issue of Journal Sustainability, MDPI, 2016.
Volunteer	■ JPL Open house volunteer, 2014.
Chair	■ First International Electronic Conference on Entropy and Its Applications, 3-21 November 2014.
Outreach Committee	■ IEEE Dallas GOLD, 2012.
IEEE GOLD	■ Sci-Tech Volunteer, 2012, Dallas, TX
Telescope Operator	■ UAlbany for public stargazing events, Fall 2009, Spring 2010, University at Albany, SUNY.
Robotics	<ul style="list-style-type: none"> ■ Demonstrator UAlbany Community Day, 2009, University at Albany, SUNY. ■ Take Our Daughters and Sons to Work Day: 2009, University at Albany, SUNY. ■ Junior first LEGO League, Fall 2008, University at Albany, SUNY.
Judicial Board	■ Graduate Student Organization 2009, University at Albany, SUNY, Albany, NY, USA.
Graduate Committee	■ Graduate Admission Committee 2009-2010, Department of Physics, University at Albany, SUNY.
Local Organizer	<ul style="list-style-type: none"> ■ MaxEnt 2007-International Conference, Saratoga Springs, NY. ■ Einstein Centennial Celebration 2005, Nepal Physical Society, Nepal.
President	■ Students Association of Physics, 2005, Tribhuvan University, Nepal.
Member	■ Executive Board 2005, Nepal Physical Society, Nepal.