MARK ALEXANDER MIKOFSKI
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EDUCATION

UNIVERSITY OF CALIFORNIA AT BERKELEY — DEC 2005
Ph.D. in Mechanical Engineering
Dissertation: Flame Structure and Soot Formation in Inverse Diffusion Flames
Major: Combustion. *Minors:* Fluid Mechanics and Air Quality
Advisor: Professor A.C. Fernandez-Pello

UNIVERSITY OF CALIFORNIA AT BERKELEY — MAY 2004
M.S. in Mechanical Engineering

SAN FRANCISCO STATE UNIVERSITY — APR 1997
California Teaching Credential for Physics and Mathematics, *U.S. Peace Corps Fellow*

BOSTON UNIVERSITY — MAY 1993
B.S. in Mechanical Engineering, *Cum Laude*

PROFESSIONAL EXPERIENCE

TEAM LEAD OF SPECIAL PROJECTS FOR SOLAR ENERGY ASSESSMENT — 2021 – PRESENT
DNV GL, Oakland CA
Evaluate PV system performance and uncertainty for developers and investors. Create Python libraries to develop, standardize, and accelerate new analyses like solar + storage. Collaborate with national labs and industry partners on methods to evaluate new technology like terrain, bifacial, and hourly modeling corrections.

PRODUCT MANAGER & MODELING SPECIALIST FOR SOLARFARMER — 2017 – 2021
DNV GL, Oakland CA
Lead product development of disruptive PV-system energy performance software delivering accurate energy assessment coupled with 3-D layout for optimization on any terrain. Implement and validate algorithms.

SENIOR STAFF RELIABILITY/PERFORMANCE ENGINEER — 2010 – 2017
SunPower Corp., Richmond CA
Develop models to predict energy and degradation of PV systems, research irradiance, cell, module and inverter performance.

SENIOR RESEARCHER, MODELING & PERFORMANCE — 2007 – 2010
AREVA Solar (formerly Ausra), Mountain View CA
Developed and validated dynamic multi-physics models for design and operation of direct steam solar thermal power system. Modeled solar thermal concentrating optics, heat losses, two-phase thermodynamics and fluid mechanics, and thermal storage systems. Analyzed performance tests.

APPLICATIONS ENGINEER, HARDWARE — 1999 – 2000
Pinnacle Technologies, San Francisco, CA
Modified, assembled and repaired tiltmeter hardware for real-time monitoring of secondary recovery operations and subsidence in oilfields, as well as for detection of earthquake, landslide and volcanic activity. Developed prototypes and conducted testing for tiltmeter hardware development.

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RESEARCH EXPERIENCE

POST-DOCTORAL RESEARCHER 2006
University of California at Berkeley, Combustion Processes Laboratory
Researched fluidized catalytic nano-particle reactor for environmentally clean power generation.

GRADUATE STUDENT RESEARCHER 2000 – 2005
University of California at Berkeley, Microgravity Combustion Laboratory
Conducted experiments on and simulations of methane and ethylene inverse diffusion flames in normal-gravity and micro-gravity to study the formation of soot and carbon monoxide in underventilated fires. Mapped temperature with thermocouples. Sampled and analyzed CO and soot emissions. Measured radiant emission with radiometer. Used laser diagnostics to obtain species profiles. Project sponsored by NASA in collaboration with NIST and Sandia National Laboratory.

TEACHING EXPERIENCE

PHYSICS TEACHER 2006 – 2007
Lighthouse Community Charter High School, Oakland, CA
Started science department at new high school serving inner city students of mostly Hispanic background. Developed physics curriculum using expeditionary learning and standards based models.

GRADUATE STUDENT INSTRUCTOR 2002 – 2004
University of California at Berkeley, Department of Mechanical Engineering
Conducted discussions for undergraduate thermodynamics and heat transfer courses and corrected exams. Led laboratory section for undergraduate combustion course and corrected exams

ADJUNCT INSTRUCTOR 2004
University of California at Berkeley, Student Learning Center
Developed and taught lessons for undergraduate calculus adjunct course, corrected and graded exams.

MATH, PHYSICS, & GENERAL SCIENCE TEACHER 1997-1999
McAteer High School, S.F.U.S.D., San Francisco, CA
Created lessons meeting district standards and appealing to at-risk youth. Served as treasurer for Staff Development Committee.

MATH & PHYSICS TEACHER 1994 – 1996
United States Peace Corps/Tanzania (East Africa)
Taught high school math and physics to second language learners in English and Swahili. Organized health education for students and teachers. Led two successful student trips to summit Mt. Kilimanjaro.

DATA & DIGITAL

LANGUAGES: Python, MATLAB, C/C++, C#, Java, FORTRAN, HTML, CSS, JS, SQL
PLATFORMS: Linux, Windows, Mac OS X, AWS, Azure, Heroku, PostgreSQL, MySQL, MSSQL, Git, Jupyter
OPEN SOURCE: `pvlib` (maintainer), `scipy`, SunPower `pvmismatch`, NREL `rdtools`, `bifacialvf`

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PUBLICATIONS & CONFERENCE PRESENTATIONS

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PUBLICATIONS

- M. A. Mikofski, W. F. Holmgren, J. Newmiller and R. Kharait, "**Effects of Solar Resource Sampling Rate and Averaging Interval on Hourly Modeling Errors**," in *IEEE Journal of Photovoltaics*, vol. 13, no. 2, pp. 202-207, March 2023, DOI: 10.1109/JPHOTOV.2023.3238512.
- M. Leung et al., "**Tracker Terrain Loss Part Two**," in *IEEE Journal of Photovoltaics*, vol. 12, no. 1, pp. 127-132, Jan. 2022, DOI: 10.1109/JPHOTOV.2021.3114599.
- G. M. Wilson *et al.*, "**The 2020 photovoltaic technologies roadmap**," *J. Phys. D. Appl. Phys.*, vol. 53, no. 49, 2020. "Ch. 10: Energy Yield Modeling" with M. Deceglie and J. Freeman, DOI: 10.1088/1361-6463/ab9c6a
- K. Anderson and M. A. Mikofski, "**Slope-Aware Backtracking for Single-Axis Trackers**," *National Renewable Energy Laboratory (NREL) Report*, NREL/TP-5K00-76626, Jul. 2020, DOI: 10.2172/1660126.
- W. F. Holmgren, C. W. Hansen, and M. A. Mikofski, "**pvlib python: a python package for modeling solar energy systems**," *J. Open Source Softw.*, vol. 3, no. 29, p. 884, Sep. 2018, DOI: 10.21105/joss.00884
- M. A. Mikofski, T. C. Williams, C. R. Shaddix, and L. G. Blevins, "**Flame height measurement of laminar inverse diffusion flames**," *Combust. Flame*, vol. 146, no. 1–2, pp. 63–72, 2006, DOI: 10.1016/j.combustflame.2006.04.006
- M. A. Mikofski, T. C. Williams, C. R. Shaddix, A. C. Fernandez-Pello, and L. G. Blevins, "**Structure of laminar sooting inverse diffusion flames**," *Combust. Flame*, vol. 149, no. 4, pp. 463–478, Jun. 2007, DOI: 10.1016/j.combustflame.2007.01.006

CONFERENCE PRESENTATIONS & POSTERS

- K. S. Anderson, W. B. Hobbs, W. F. Holmgren, K. R. Perry, M. A. Mikofski and R. A. Kharait, "**The Effect of Inverter Loading Ratio on Energy Estimate Bias**," *2022 IEEE 49th Photovoltaics Specialists Conference (PVSC)*, 2022, pp. 0714-0720, DOI: 10.1109/PVSC48317.2022.9938632.
- A. Parikh, K. Perry, K. Anderson, W. B. Hobbs, R. Kharait and M. A. Mikofski, "**Validation of Subhourly Clipping Loss Error Corrections**," *2021 IEEE 48th Photovoltaic Specialists Conference (PVSC)*, 2021, pp. 1670-1675, DOI: 10.1109/PVSC43889.2021.9518564.
- M. A. Mikofski and R. Kharait, "**Comparison of Predicted PV System Performance with SURFRAD versus TMY**," *2021 IEEE 48th Photovoltaic Specialists Conference (PVSC)*, 2021, pp. 2155-2159, DOI: 10.1109/PVSC43889.2021.9519024.
- A. Neubert, M. Hamer, R. A. Kharait and M. A. Mikofski, "**Bifacial Solar Sensitivity to Project Capacity Size**," *2020 47th IEEE Photovoltaic Specialists Conference (PVSC)*, 2020, pp. 0703-0706, DOI: 10.1109/PVSC45281.2020.9300712.
- E. L. Warren *et al.*, "**The value of diversity in the renewable energy industry and research community**," *2020 47th IEEE Photovoltaic Specialists Conference (PVSC)*, 2020, pp. 0652-0654, DOI: 10.1109/PVSC45281.2020.9300582.
- R. Kharait, S. Raju, A. Parikh, M. A. Mikofski and J. Newmiller, "**Energy Yield and Clipping Loss Corrections for Hourly Inputs in Climates with Solar Variability**," *2020 47th IEEE Photovoltaic Specialists Conference (PVSC)*, 2020, pp. 1330-1334, DOI: 10.1109/PVSC45281.2020.9300911.
- M. A. Mikofski and P. J. Rainey, "**Tracker Terrain Losses**," *2020 47th IEEE Photovoltaic Specialists Conference (PVSC)*, 2020, pp. 1859-1862, DOI: 10.1109/PVSC45281.2020.9300381.

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- M. A. Mikofski, R. Darawali, M. Hamer, A. Neubert, and J. Newmiller, "**Bifacial Performance Modeling in Large Arrays**," in *2019 IEEE 46th Photovoltaic Specialist Conference (PVSC)*, 2019, DOI: 10.1109/PVSC40753.2019.8980572
- W. F. Holmgren, C. W. Hansen, J. S. Stein, and M. A. Mikofski, "**Review of Open Source Tools for PV Modeling**," in *2018 IEEE 7th World Conference on Photovoltaic Energy Conversion (WCPEC) (A Joint Conference of 45th IEEE PVSC, 28th PVSEC & 34th EU PVSEC)*, 2018, pp. 2557–2560, DOI: 10.1109/PVSC.2018.8548231
- M. A. Mikofski, *et al.*, "**Accurate Performance Predictions of Large PV Systems with Shading using Submodule Mismatch Calculation**," in *2018 IEEE 7th World Conference on Photovoltaic Energy Conversion (WCPEC) (A Joint Conference of 45th IEEE PVSC, 28th PVSEC & 34th EU PVSEC)*, 2018, pp. 3635–3639, DOI: 10.1109/PVSC.2018.8547323
- M. A. Mikofski, C. W. Hansen, W. F. Holmgren, and G. M. Kimball, "**Use of measured aerosol optical depth and precipitable water to model clear sky irradiance**," in *2017 IEEE 44th Photovoltaic Specialist Conference (PVSC)*, 2017, no. July, pp. 110–116, DOI: 10.1109/PVSC.2017.8366314
- B. Meyers and M. Mikofski, "**Accurate Modeling of Partially Shaded PV Arrays**," in *2017 IEEE 44th Photovoltaic Specialist Conference (PVSC)*, 2017, pp. 3354–3359, DOI: 10.1109/PVSC.2017.8521559
- M. Mikofski, A. Oumbe, C. Li, and B. Bourne, "**Evaluation and correction of the impact of spectral variation of irradiance on PV performance**," in *2016 IEEE 43rd Photovoltaic Specialists Conference (PVSC)*, 2016, pp. 1357–1362, DOI: 10.1109/PVSC.2016.7749837
- B. Meyers, M. Mikofski, and M. Anderson, "**A fast parameterized model for predicting PV system performance under partial shade conditions**," in *2016 IEEE 43rd Photovoltaic Specialists Conference (PVSC)*, 2016, pp. 3173–3178, DOI: 10.1109/PVSC.2016.7750251
- E. Hasselbrink *et al.*, "**Validation of the PVLife model using 3 million module-years of live site data**," in *2013 IEEE 39th Photovoltaic Specialists Conference (PVSC)*, 2013, pp. 7–12. DOI: 10.1109/PVSC.2013.6744087
- M. A. Mikofski *et al.*, "**PVLife: An Integrated Model for Predicting PV Performance Degradation over 25+ Years**," in *2012 38th IEEE Photovoltaic Specialists Conference*, 2012, no. 3, pp. 1744–1749, DOI: 10.1109/PVSC.2012.6317932
- M. Mikofski *et al.*, "**A Dynamic Cell-By-Cell PV System Model to Predict Lifetime Performance and Reliability**," in *26th European Photovoltaic Solar Energy Conference and Exhibition*, 2011, pp. 105–112, DOI: 10.4229/26thEUPVSEC2011-1BO.10.1
- K. T. Macko, M. A. Mikofski, A. C. Fernandez-Pello, L. G. Blevins, and R. W. Davis, "**Laser extinction in laminar inverse diffusion flames**," in *Fall Technical Meeting of the Western States Section of the Combustion Institute 2005, WSS/CI 2005 Fall Meeting*, 2005, vol. 2, https://escholarship.org/uc/item/5xq8441t
- M. A. Mikofski, L. G. Blevins, T. C. Williams, and C. R. Shaddix, "**Effect of varied air flow on flame structure of laminar inverse diffusion flames**," in *30th International Symposium on Combustion, Abstracts of Works-in-Progress Posters*, 2004.
- M. A. Mikofski, T. C. Williams, C. R. Shaddix, and L. G. Blevins, "**Effect of Varied Air Flow on Flame Structure of Laminar Inverse Diffusion Flames**," in *Western States Section/Combustion Institute 2004 Spring Meeting*, 2004, https://escholarship.org/uc/item/7fg575cm
- M. A. Mikofski, L. G. Blevins, R. W. Davis, E. F. Moore, and G. W. Mulholland, "**COSMIC: Carbon Monoxide and Soot in Microgravity Inverse Combustion**," in *7th International Workshop on Microgravity Combustion and Chemically Reacting Systems*, 2003, https://escholarship.org/uc/item/7xb9t2gk
- L. G. Blevins, N. Y. C. Yang, M. A. Mikofski, G. W. Mulholland, and R. W. Davis, "**Alteration of early soot pathways using microgravity**," in *41st Aerospace Sciences Meeting and Exhibit*, 2003, DOI: 10.2514/6.2003-985