Gregory Dobler, PhD

Biden School of Public Policy and Administration email: gdobler@udel.edu
Department of Physics and Astronomy http://www.MUONetwork.org
Data Science Institute
University of Delaware

Employment

University of Delaware	Associate Professor	2022 - present
	Assistant Professor	2019 - 2022
	Director of the Urban Observatory	2019 - present
Center for Urban Science and Progress	Associate Director (physical sciences)	2015 - 2019
New York University	Director of the Urban Observatory	2015 - 2019
	Urban Observatory Chief Scientist	2013 - 2015
	Senior Scientist	2013 - 2019
	Research Assistant Professor	2013 - 2019
Kavli Institute for Theoretical Physics	Karp Fellow	2009 - 2013
Univ of California, Santa Barbara		
Harvard University	Postdoctoral Fellow	2006 - 2009

Education

University of Pennsylvania	Physics and Astronomy	PhD, 2006
University of Pennsylvania	Physics and Astronomy	MS, 2003
Haverford College	Physics (Mathematics minor)	BS, 2001

Research Focus

2013-present Urban Science, Urban Informatics, Public Policy, Remote Sensing, Computer Vision, Machine Learning, Observational Techniques, Physics, and Data Mining to study the interactions of the Human, Natural, and Built components of Complex Urban Systems. Applications include energy consumption and its environmental impacts, public health, patterns of life, energy monitoring, technology adoption and penetration, urban heat island, surrogate traffic safety measures, and human mobility.

2004-2013 Data-driven astrophysics including image processing and computer vision, time series analysis, and machine learning applied to full-sky imaging data sets. Applications included discovery of one of the largest structures in our Milky Way galaxy, indirect probes of particle dark matter, gravitational lensing, and interstellar medium physics.

Publications

* - indicates lead author/mentor publication

1. * *Atmospheric correction of vegetation reflectance with simulation-trained deep learning for ground-based hyperspectral remote sensing*. Qamar, F. and **Dobler, G.**, 2023, Plant Methods, 19(1), p.74.

2. *What's the Difference? The Potential for Convolutional Neural Networks for Transient Detection without Template Subtraction*. Acero-Cuellar, T., Bianco, F., **Dobler, G.**, Sako, M., Qu, H. and LSST Dark Energy Science Collaboration, 2023. The Astronomical Journal, 166(3), p.115.
3. * *Covariance in policy diffusion: Evidence from the adoption of hyperlocal air quality monitoring programs by US cities*. Qamar, F., Pierce, A.L. and **Dobler, G.**, 2023. Cities, 138, p.104363.
4. ***** *The Impacts of Air Quality on Vegetation Health in Dense Urban Environments: A Ground-Based Hyperspectral Imaging Approach*. Qamar, F., Sharma, M.S. and **Dobler, G.**, 2022. Remote Sensing, 14(16), p.3854.
5. ***** *Toward the Automated Detection of Light Echoes in Synoptic Surveys: Considerations on the Application of Deep Convolutional Neural Networks.* Li, X., Bianco, F.B., **Dobler, G.**, Partoush, R., Rest, A., Acero-Cuellar, T., Clarke, R., Fortino, W.F., Khakpash, S. and Lian, M., 2022. The Astronomical Journal, 164(6), p.250.
6. *Do cities have a unique magnetic pulse?*. 2022. Dumont, V., Bowen, T.A., Roglans, R., **Dobler, G.**, Sharma, M.S., Karpf, A., Bale, S.D., Wickenbrock, A., Zhivun, E., Kornack, T. and Wurtele, J.S., Journal of Applied Physics, 131(20), p.204902.
7. ***** *Operational characteristics of residential air conditioners with temporally granular remote thermographic imaging*. 2021. Arjunan, P., **Dobler, G.**, Lee, K., Miller, C., Biljecki, F. and Poolla, K., November. In Proceedings of the 8th ACM international conference on systems for energy-efficient buildings, cities, and transportation (pp. 184-187).
8. ***** *The Urban Observatory: a Multi-Modal Imaging Platform for the Study of Dynamics in Complex Urban Systems*. 2021. **Dobler, G.**, Bianco, F.B., Sharma, M.S., Karpf, A., Baur, J., Ghandehari, M., Wurtele, J.S. and Koonin, S.E. Remote Sensing, 13(8), p.1426.
9. ***** *Data Science Contributions to Performance Management*. 2021. **Dobler, G.** and Aristigueta, M. Public Productivity and Performance Handbook (pp. 253-274), Routledge.
10. ***** *Patterns of Urban Foot Traffic Dynamics*. 2021. **Dobler, G.**, Vani, J. and Dam, T.T.L. Computers, Environment and Urban Systems, 89, p.101674.
11. *Hospital length-of-stay among COVID-19 positive patients*. 2021. Subedi, K., Chiam, T., Chen, D., Best, E., Bianco, F., **Dobler, G.,** and Papas, M. Journal of Clinical and Translational Research, *7(3), p.377*.
12. ***** *The Effects of Atmospheric Modeling Covariance on Ground-based Hyperspectral Measurements of Surface Reflectance*. 2021. Qamar, F., Gómez-Fonseca, A.S., and **Dobler, G**. 2021 11th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS) (pp. 1-5). IEEE.
13. ***** *System, method, and computer-accessible medium for remote sensing of the electrical distribution grid with hypertemporal imaging*. 2020. Bianco, F.B., **Dobler, G.G.** and Koonin, S.E. New York University, U.S. Patent Application 16/581,966.
14. ***** *Pixel-Wise Classification of High-Resolution Ground-Based Urban Hyperspectral Images with Convolutional Neural Networks*. 2020. Qamar, F. and **Dobler, G**. Remote Sensing, 12(16), p.2540.

15. *A network of magnetometers for multi-scale urban science and informatics*. 2019. Bowen, T.A., Zhivun, E., Wickenbrock, A., Dumont, V., Bale, S.D., Pankow, C., **Dobler, G.**, Wurtele, J.S., and Budker, D. Geoscientific Instrumentation, Methods and Data Systems, 8(1), pp.129-138.
16. ***** *TrackNet: Simultaneous Object Detection and Tracking and Its Application in Traffic Video Analysis*. 2019. Li, C., **Dobler, G.**, Feng, X. and Wang, Y. arXiv preprint arXiv:1902.01466.
17. ***** *Persistent Hyperspectral Observations of the Urban Lightscape*. 2018. Baur, J., **Dobler, G.**, Bianco, F., Sharma, M. and Karpf, A. In 2018 IEEE Global Conference on Signal and Information Processing (GlobalSIP) (pp. 983-987). IEEE.
18. *Mapping Refrigerant Gases in the New York City Skyline*. 2017. Ghandehari, M., Aghamohamadnia, M., **Dobler, G.**, Karpf, A., Buckland, K., Qian, J. and Koonin, S.E. Nature: Scientific Reports, 7(6), p.2735.
19. ***** *Patterns of waste generation: A gradient boosting model for short-term waste prediction in New York City*. 2017. Johnson, N.E., Ianiuk, O., Cazap, D., Liu, L., Starobin, D., **Dobler, G**. and Ghandehari, M. Waste Management, 62, pp.3-11
20. ***** *A Hyperspectral Survey of New York City Lighting Technology*. 2016. **Dobler, G.**, Ghandehari, M., Koonin, S.E. and Sharma, M.S. Sensors, 16(12), p.2047.
21. *Ground based hyperspectral imaging of urban emissions*. 2016. Ghandehari, M., Aghamohamadnia, M., **Dobler, G.**, Karpf, A., Cavalcante, C., Buckland, K., Qian, J., and Koonin, S. IEEE Whispers, Los Angeles, CA.
22. *Development of a comprehensive framework for video-based safety assessment*. 2016. Xie, K., Li, C., Ozbay, K., **Dobler, G.**, Yang, H., Chiang, A.T. and Ghandehari, M. In Intelligent Transportation Systems (ITSC), 2016 IEEE 19th International Conference on (pp. 2638-2643). IEEE.
23. ***** *Robust vehicle tracking for urban traffic videos at intersections*. 2016. Li, C., Chiang, A., **Dobler, G.**, Wang, Y., Xie, K., Ozbay, K., Ghandehari, M., Zhou, J. and Wang, D. In Advanced Video and Signal Based Surveillance (AVSS), 2016 13th IEEE International Conference on (pp. 207-213). IEEE.
24. ***** *Dynamics of the urban lightscape*. 2015. **Dobler, G.**, Ghandehari, M., Koonin, S.E., Nazari, R., Patrinos, A., Sharma, M.S., Tafvizi, A., Vo, H.T. and Wurtele, J.S. Information Systems, 54, pp.115-126.
25. *Strong lens time delay challenge. II. Results of TDC1*. 2015. Liao, K., Treu, T., Marshall, P., Fassnacht, C.D., Rumbaugh, N., **Dobler, G.**, Aghamousa, A., Bonvin, V., Courbin, F., Hojjati, A. and Jackson, N. The Astrophysical Journal, 800(1), p.11.
26. ***** *Strong lens time delay challenge. I. Experimental design*. 2015. **Dobler, G.**, Fassnacht, C.D., Treu, T., Marshall, P., Liao, K., Hojjati, A., Linder, E. and Rumbaugh, N. The Astrophysical Journal, 799(2), p.168.
27. ***** *Urban Physics*. 2014. Koonin, S.E., **Dobler, G.**, and Wurtele J. American Physical Society News, Back Page, 23, 3.
28. *Planck 2013 results. XIII. Diffuse component separation*. 2014. Planck Collaboration. Astronomy & Astrophysics, 571, p.A12.

29. *Planck intermediate results. XII: Diffuse Galactic components in the Gould Belt system*. 2013. Planck Collaboration. Astronomy & Astrophysics, 557, p.A53.
30. ***** *Planck intermediate results: IX. Detection of the galactic haze with Planck*. 2013. **Planck Collaboration**. Astronomy & Astrophysics, 554, p.A139
31. ***** *Identifying the Radio Bubble Nature of the Microwave Haze.* 2012. **Dobler, G.** The Astrophysical Journal Letters, 760(1), p.L8.
32. ***** *A last look at the microwave haze/bubbles with WMAP*. 2012. **Dobler, G.** The Astrophysical Journal, 750(1), p.17.
33. *The Fermi Bubbles. II. The Potential Roles of Viscosity and Cosmic-Ray Diffusion in Jet Models*. 2012. Guo, F., Mathews, W.G., **Dobler, G.** and Oh, S.P. The Astrophysical Journal, 756(2), p.182.
34. *Analysis of WMAP 7 Year Temperature Data: Astrophysics of the Galactic Haze*. 2012. Pietrobon, D., Górski, K.M., Bartlett, J., Banday, A.J., **Dobler, G.**, Colombo, L.P., Hildebrandt, S.R., Jewell, J.B., Pagano, L., Rocha, G. and Eriksen, H.K. The Astrophysical Journal, 755(1), p.69.
35. ***** T*he Fermi gamma-ray haze from dark matter annihilations and anisotropic diffusion*. 2011. **Dobler, G.**, Cholis, I. and Weiner, N. The Astrophysical Journal, 741(1), p.25.
36. *The electron injection spectrum determined by anomalous excesses in cosmic ray, gamma ray, and microwave data*. 2010. Lin, T., Finkbeiner, D.P. and **Dobler, G.** Physical Review D, 82(2), p.023518.
37. *Selecting quasars by their intrinsic variability*. 2010. Schmidt, K.B., Marshall, P.J., Rix, H.W., Jester, S., Hennawi, J.F. and **Dobler, G.** The Astrophysical Journal, 714(2), p.1194.
38. ***** *The Fermi haze: a gamma-ray counterpart to the microwave haze*. 2010. **Dobler, G.**, Finkbeiner, D.P., Cholis, I., Slatyer, T. and Weiner, N. The Astrophysical Journal, 717(2), p.825.
39. *The Fermi gamma-ray spectrum of the inner galaxy: Implications for annihilating dark matter*. 2009. Cholis, I., **Dobler, G.**, Finkbeiner, D.P., Goodenough, L., Slatyer, T.R. and Weiner, N. arXiv preprint arXiv:0907.3953.
40. ***** *Constraining spinning dust parameters with the wmap five-year data*. 2009. **Dobler, G.**, Draine, B. and Finkbeiner, D.P. The Astrophysical Journal, 699(2), p.1374.
41. *Case for a 700+ GeV WIMP: Cosmic ray spectra from PAMELA, Fermi, and ATIC*. 2009. Cholis, I., **Dobler, G.**, Finkbeiner, D.P., Goodenough, L. and Weiner, N. Physical Review D, 80(12), p.123518.
42. *Prospects for detecting dark matter with GLAST in light of the WMAP haze*. 2008. Hooper, D., Zaharijas, G., Finkbeiner, D.P. and **Dobler, G.** Physical Review D, 77(4), p.043511.
43. ***** *Extended anomalous foreground emission in the WMAP three-year data*. 2008. **Dobler, G.** and Finkbeiner, D.P. The Astrophysical Journal, 680(2), p.1222.
44. ***** *Identification of Spinning Dust in Hα-Correlated Microwave Emission*. 2008. **Dobler, G.** and Finkbeiner, D.P. The Astrophysical Journal, 680(2), p.1235.

45. ***** *Lensing probabilities for spectroscopically selected galaxy-galaxy strong lenses*. 2008. **Dobler, G.**, Keeton, C.R., Bolton, A.S. and Burles, S. The Astrophysical Journal, 685(1), p.57.
46. *Possible evidence for dark matter annihilations from the excess microwave emission around the center of the Galaxy seen by the Wilkinson Microwave Anisotropy Probe*. 2007. Hooper, D., Finkbeiner, D.P. and **Dobler, G.** Physical Review D, 76(8), p.083012.
47. ***** *Microlensing of central images in strong gravitational lens systems*. 2007. **Dobler, G.**, Keeton, C.R. and Wambsganss, J. Monthly Notices of the Royal Astronomical Society, 377(3), pp.977-986.
48. ***** *Microlensing of lensed supernovae*. 2006. **Dobler, G.** and Keeton, C.R. The Astrophysical Journal, 653(2), p.1391.
49. ***** *Finite source effects in strong lensing: implications for the substructure mass scale*. 2006. **Dobler, G.** and Keeton, C.R. Monthly Notices of the Royal Astronomical Society, 365(4), pp.1243-1262.
50. *Mixing rates and symmetry breaking in two-dimensional chaotic flow*. 2003. Voth, G.A., Saint, T.C., **Dobler, G.** and Gollub, J.P. Physics of Fluids, 15(9), pp.2560-2566.

White papers

1. *LSST science book, version 2.0*. 2009. Abell, P.A., et al. arXiv preprint arXiv:0912.0201.
2. *Prospects for polarized foreground removal*. 2009. Dunkley, J., Amblard, A., Baccigalupi, C., Betoule, M., Chuss, D., Cooray, A., Delabrouille, J., Dickinson, C., **Dobler, G.**, Dotson, J. and Eriksen, H.K. In AIP Conference Proceedings (Vol. 1141, No. 1, pp. 222-264). AIP.
3. *Foreground Science Knowledge and Prospects*. 2009. Fraisse, A.A., Brown, J.A.C., **Dobler, G.**, Dotson, J.L., Draine, B.T., Frisch, P.C., Haverkorn, M., Hirata, C.M., Jansson, R., Lazarian, A. and Magalhães, A.M. In AIP Conference Proceedings (Vol. 1141, No. 1, pp. 265-310). AIP.
4. *Strong gravitational lensing probes of the particle nature of dark matter*. 2009. Moustakas, L.A., et al. arXiv preprint arXiv:0902.3219.
5. *Dark Matter Structures in the Universe: Prospects for Optical Astronomy in the Next Decade*. 2009. Marshall P.J., et al. Astro2010: The Astronomy and Astrophysics Decadal Survey, Science White Papers, no. 194.

Colloquia, Seminars, and Talks

I have given over 50 colloquia, talks, panels, and seminars on topics in Urban Science, the Urban Observatory, Smart Cities, Sensing, and Astrophysics. A few recent and representative examples include:

Invited

- University of Washington e-Science Institute Colloquium 2016
- Artificial Light at Night 2016
- Big Data and the Internet of Things 2017
- Texas A&M Physics Colloquium 2018

- University of California, Berkeley Physics Colloquium 2019
- University of Wisconsin, Milwaukee Digital Humanities Lab Colloquium 2019
- ChristianaCare Value Institute Seminar Series 2020

Contributed

- Network of Schools of Public Policy, Affairs, and Administration (NASPPA) 2019
- American Association of Geographers (AAG) 2020
- North East Conference on Public Administration (NECoPA) 2020
- Academic Data Science Alliance (ADSA) Annual Meeting 2020

Grant Funding and Awards

- NSF HDR DSC: DE and Mid-Atlantic Data Science Corps (2021 **Co-PI**, award: **$1,500,000**)
- NSF AAG: Light Echoes in the Era of Rubin and AI (2021 **Co-I**, award: **$596,067**)
- NIH DE CTR ACCEL (2020 **PI**, award: **$80,000**)
- NSF South Big Data Hubs Seed Grant (2020 **Co-PI**, award: **$10,000**)
- UD GUR (2020 **PI**, award: **$15,000**)
- NSF RII Track-2 FEC: The IceCube EPSCoR Initiative (2020 **Co-I**, award: **$3,000,000**)
- DE INBRE Core Access Award (2019 **PI**, award: **$8,000**)
- NSF EAGER: Smart Community Big Data Co-op (2018 **Co-PI**, award: **$300,000**)
- DOE ARPA-E IDEAS (2018 **Co-PI**, award: **$500,000**)
- James S. McDonnell Complex Systems Scholar (2015-2018 **PI**, award: **$450,000**)
- Leon Levy Foundation (2016-2018 **Co-I,** award: **$245,000**)
- CUSP Distinguished Teaching and Mentor Award (2015)
- AIG International, Sponsored research grant (2014-2016 **Co-I**, award: **$275,000**)
- Harvey L. Karp Discovery Award (2010 **PI**, award: **$50,000**)
- Graduated Magna Cum Laude, High Honors in Physics, Phi Beta Kappa society (2001)

Teaching

2019-present	Univ of Delaware	**Machine Learning for Public Policy**
2020-present	Univ of Delaware	**Data Science Tools for Evidence-based Policy**
2020-present	Univ of Delaware	**Computer Vision for the Physical Sciences**
2014-2018	New York Univ	*Center for Urban Science and Progress* **Capstones**:

“Economic Map of New York City”
“From Light Variability to Energy Consumption”
“NYCEM: New York City Economic Map”
“Parks Quality Assessment”
“Parks Condition Assessment”
“Computer Vision for Pedestrian Foot Traffic”
“First Empirical Quantification of the Rebound Effect”
“Impact of Artificial Light at Night on Bird Migration”
“Detection of Polluting Plumes Ejected from NYC Buildings”
“Automated Detection of Street-Level Tobacco Product Displays”

2014 - 2017	New York Univ	**Applied Data Science** and **Advanced Topics in Urban Informatics**
2012	UC, Santa Barbara	**Introductory Physics**
2008 - 2009	Harvard Univ	Guest lecturer for **Principles of Astronomical Measurement**
2004 - 2005	Univ of Pennsylvania	Teaching Assistant for **Introduction to Astrophysics**
2003 - 2004	Univ of Pennsylvania	Guest lecturer for **Introduction to Astrophysics** and **Foundations of Modern Cosmology**
2003	Univ of Pennsylvania	Teaching Assistant for **Foundations in Modern Cosmology**
2003	Univ of Pennsylvania	Private tutor for undergraduate physics students
2001 - 2002	Univ of Pennsylvania	Instructor for undergraduate physics laboratory
1999 - 2000	Haverford College	Teaching Assistant for **Classical and Modern Physics**

Students

PhD students

Farid Qamar UD PhD thesis advisee
Assessment of the Health of Urban Greenspaces with Remote Imaging

Lan Yu UD PhD thesis advisee
Light and the City: Energy End-Use, Power Distribution, and Lighting Policy Impacts

Kyungmin Lee UD PhD thesis advisee
The Impact of Behavior and the Built Environment on Energy Use and Heat in Cities

Chenge Li co-advisee with NYU Prof Yao Wang
Multi-Object Tracking with End-to-End Deep Convolutional Nets

An-Ti Chiang co-advisee with NYU Prof Yao Wang
Surrogate Safety Measures in Traffic Video through Multi-Object Tracking

Master's Students

Ian Heffner
Detection and Tracking of Pollution Plumes with Urban Observatory Imaging

Samuel Seo
Spatial Inhomogeneity in the Distribution of Urban Greenspaces

Jonathan Clifford
Delaware Hospitalization and Recovery Metrics Analysis

Mary Manz
Using Hyperspectral Imaging to Measure LED Changeover Rates

Manjula Ibrahim
Neural Network-based Emulators for COVID Hospitalization Simulations

Christian Moscardi

Spatio-temporal Correlations between Light at Night and Neighborhood-scale Bird Densities

Emil Christensen
NYCENE: Photogrammetric Alignment of Side-facing Urban Proximal Imaging

Anupama Santhosh
Lighting Variability as a Proxy for Building Energy Consumption using Deep Neural Networks

Daynan Crull, Akshay Penmatcha, Anastasia Shegay, Priyanshi Singh
Quantifying Rebound with Broadband visible and VNIR Hyperspectral Imaging

Trang Dam, Jordan Vani
Human Detection in Urban Traffic Video

Nurvirta Monarizqa, Dongjie Fan
Detection of Tobacco Signs in Street-level Imaging with Deep Learning

Yao Wang, Claire Huang
Identifying Internal Energy Dynamics of Buildings from Thermal Envelopes

Ilan Reinstein
A Computer Vision Approach to Assessing Environmental Impacts of Building Energy Use

Priya Khokher, Denis Khryashchev, Alec McLean, Richard Nam, Bilguun Turboli, Boya Yu
Detecting Humans in Urban Public Video Data

Dhia Barnes, Neil Verosh D'Souza, Michael Evans, Venkat Motupalli, Xia Wang
Predictive Models of Park Quality

Sara Arango-Franco
Building Level Load Curve Estimation from Aggregated Transformer Data

Vipassana Vijayarangan
Identification of "Social Landmarks" in Twitter Data

Philipp Kats
Indicators of Park Quality in 311 Data

Tong Jian, Kenneth Luna, Samuel Pollack, Julia Smith
NYCEM: New York City Economic Map

Ouafa Benkraouda, Danyang Chen, Justin Gordon, Amanda Rose Doyle
Quality Assessment of Public Parks

Bartosz Bonczak, Emil Christensen, Joe McLaughlin
From Light Variability to Energy Consumption

Maha Yaqub
Temporal Based Image Segmentation, Imaging Insolation

Ady Sevy, Meredith McCarron, Sriniketh Vijayaraghavan
Geotagging Non-Geotagged Social Media Data

Peter Varshavsky
Video Superresolution for Urban Applications

Andrea Kanner, Kara Leary, Awais Malik
Economic Profile Map of NYC

Mohit Sharma
CitySynth: Imaging with a Network of Devices

Undergraduate Students

Angie Stephanie Gómez-Fonseca
Quantifying Uncertainty in Measurements of Molecular Air Pollution via MCMC Methods

Colleen Mueller
Detection of Point-of-Sale Tobacco Advertising in Google Street View Imaging

Aleksey Bilogur
Urban Physiology

Pearson Miller
Image Segmentation through Topographic Projection

Daniel D'Orazio
Quantifying Dark Matter Substructure with Gravitational Lensing

Lauren Weiss
Searching for Dark Matter Beyond the WMAP Haze

Sarah Satinover
A Milky Way Simulation as a Test for the "eXciting Dark Matter" Theory

High School Students

Avni Memanii, Isabelle Julia Chau
311 Indicators of Gentrification in New York City

Academic Outreach and Public Service Activities

Collaboration with ChristianaCare Value Institute and Delaware Emergency Management Agency – This collaboration between our group and *all* Delaware hospitals is generating daily predictions for hospital bed demand due to COVID-19 by generating numerical simulations that are fit to daily hospital intake data. These models are used by DEMA, ChristanaCare, and other state hospitals for capacity planning and management.

Collaboration with NYC Audubon – My group is working with the NYC Audubon (NYCA) bird conservancy to deploy a remote imaging system with networked cameras to observe ambient light from buildings in NYC. We are currently collaborating on ways to use this data to strategically deploy their volunteers (who are tasked with counting dead birds at street level) to maximally inform their studies of the effects of building light at night on bird mortality during migration seasons.

NYC Department of Parks and Recreation: Park Condition Assessment – Working with a team of students from NYU/CUSP's Master's program, I collaborated with the NYC Department of Parks and Recreation (DPR) on a multi-year study of the impacts of maintenance operations on park condition in NYC as well as geospatial and temporal correlations between neighborhood and park characteristics with park condition as assessed by their Parks Inspection Program.

NYC Department of Parks and Recreation: Park Utilization – With the DPR, I designed a system of camera deployments to count the number of users of selected park space including usage characteristics. The system incorporated computer vision models of the scene that were used to identify the number of occupants of a park as a function of time.

Participation in NYU GSTEM – During the summer of 2016, I supervised two high school women through NYU's Girl's Science, Technology, Engineering, and Math (GSTEM) summer program. I designed a project that aligned with their interests in becoming more familiar with technology and statistics that was based on identifying gentrification of neighborhoods in NYC from public 311 complaint line data.

Lead developer of the first "Time Delay Challenge" (TDC0) database – I was the lead developer of a suite of simulations designed as a "challenge" to teams of astronomers around the world to test the efficacy of their analysis methods for extracting cosmological parameters from gravitational lens time delays in time series data.

First release of maps from the Fermi Gamma-Ray Space Telescope – I generated and released the first full sky maps from data from the Fermi Gamma-Ray Space Telescope for use by the astronomical community. Those maps are still available for download: https://faun.rc.fas.harvard.edu/dfink/skymaps/fermi/.

High school outreach lectures – I designed and delivered lectures on Gravity, Gravitational Lensing, and Dark Matter for high school students. I gave a sequence of these lectures for Bishop Garcia Diego High School and for the "High School Summer Science Program" in Santa Barbara, CA.

Academic Service Activities (selected)

- **Editorial Board** member of *Remote Sensing*, "Urban Remote Sensing" section
- **Guest Editor** of *Remote Sensing* Special Issue "Monitoring and Assessment of Energy Consumption through Remote Sensing"
- **Reviewer** for numerous academic journals including
  - *Remote Sensing*
  - *Sensors*
  - *Studies in Conservation*
  - *Geoscience and Remote Sensing Letters*
  - *IEEE Transactions on Big Data*
  - *Journal of Intelligent Transportation Systems*
- **Proposal Review Panel** member for the *National Science Foundation*'s "Cyber-Physical Systems" programs
- **Ad-hoc Reviewer** for the *National Science Foundation*'s "Doctoral Dissertation Research Improvement" program
- **University of Delaware** academic service:
  - Secretary of the Faculty Senate (2021-2023)
  - Instructional, Computing, and Research Support Services Committee
  - Graduate College Council (incl Expanding Research Opportunities Working Group)
  - *Data Science Institute* Faculty Council including:

        - Infrastructure Working Group
        - Research Working Group
        - Training Working
        - External Relations Working Group
    - *Biden School* Diversity, Equity, and Inclusion Working Group
    - *Biden School* Seminar Committee (chair 2020-2021)
    - Developer and Director of *Biden School* ***Urban Data Science Certificate*** program
- **New York University**, **Center for Urban Science and Progress** academic service:
    - Curriculum Committee
    - Admissions Committee
    - Capstone Committee