Mark G. Flanner

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PROFESSIONAL APPOINTMENTS

2021–*pres*	*Professor*, Climate and Space Sciences and Engineering, University of Michigan, Ann Arbor MI
2015–2021	*Associate Professor*, Climate and Space Sciences and Engineering, University of Michigan, Ann Arbor MI
2016–2017	Visiting scholar at the Institut des Géosciences de l'Environnement (IGE), Université Grenoble Alpes, France
2009–2015	*Assistant Professor*, Atmospheric, Oceanic and Space Sciences, University of Michigan, Ann Arbor MI
2007–2009	*Postdoctoral Fellow*, Advanced Study Program (ASP), National Center for Atmospheric Research, Boulder CO

EDUCATION

Ph.D. (2007)	Earth System Science, University of California, Irvine. Thesis advisor: Charlie Zender
B.S. (2002)	Biomedical Engineering, University of Wisconsin, Madison (2000: visiting student at the Technical University of Budapest, Hungary)

OUTREACH, SERVICE, and SYNERGISTIC ACTIVITIES

2018–*pres*	U. of M. representative to the University Corporation of Atmospheric Research (UCAR)
2007–*pres*	Peer-reviewer for more than 100 unique journal article submissions
2004–*pres*	Author and maintainer of the Snow, Ice, and Aerosol Radiative (SNICAR) model (online at: http://snow.engin.umich.edu/)
2016–2022	Co-chair, Arctic Monitoring and Assessment Programme (AMAP) Short-lived Climate Forcers Expert Group
2018–2022	Associate Editor for *The Cryosphere*
2017–2021	Member of the NSF Advisory Committee for the Office of Polar Programs
2020–2021	Member of AGU Macelwane Medal Selection Committee
Sept. 2020	Panelist for event: “The Future of the Outdoor State: Climate Impacts in the Midwest”, hosted by Protect Our Winters (POW)
2015–2019	Member of the *Eos* Editorial Advisory Board
2015–2018	Steering committee member for the snow model intercomparison project: ESM-SnowMIP
January 2017	Guest lecturer for the European Research Course on Atmospheres (ERCA), Grenoble France
2009–2015	U.S. representative to the Arctic Monitoring and Assessment Programme (AMAP) Short-Lived Climate Forcers Expert Group. A lead author of 2011 AMAP report: *The Impact of Black Carbon on Arctic Climate*, and 2015 report: *Black carbon and ozone as Arctic climate forcers*
July 2014	Guest lecturer at 2014 Connaught Summer Institute in Arctic Science (“Atmosphere, Cryosphere, and Climate”), Alliston, Ontario

2010–2013	Contributing author to Chapter 7 (Clouds and Aerosols) of the IPCC Working Group 1 Fifth Assessment Report
June 2012	Guest lecturer at Alpine Summer School Course XX ("Climate, Aerosols and the Cryosphere"), Valsavarenche, Italy
2010–2011	A lead author of 2011 UNEP/WMO report: *Integrated Assessment of Black Carbon and Tropospheric Ozone*

HONORS

2022	Recipient of the John F. Ullrich Education Excellence Award
2018	Named a *Highly Cited Researcher* by Clarivate Analytics
2017	Nominated by students for the U-M Golden Apple Award, which recognizes outstanding university teaching
2015	AGU 2014 Editors' Citation for Excellence in Refereeing – *Journal of Geophysical Research Atmospheres*
2013	Awarded Faculty Early Career Development (CAREER) grant from the National Science Foundation
2012	On invitation from Secretary of State Hillary Clinton, attended State Department announcement of new U.S.-led Climate & Clean Air Coalition (CCAC) to reduce short-lived climate pollutants
2005–2007	NASA Earth System Science Fellowship
2006	Outstanding Student Presentation Award (oral), Fall 2005 Meeting of the American Geophysical Union
2005	UCI Medal student award

TEACHING / ADVISING (as of Jan. 2024)

CLIMATE 105	*Our Changing Atmosphere* (5 semesters)
CLIMATE 380	*Introduction to Atmospheric Radiation* (6 semesters)
CLIMATE 473	*Climate Physics* (10 semesters)
CLIMATE 532	*Radiative Transfer* (4 semesters)
Advising	Chairing/chaired thesis committees of 1 current / 7 former Ph.D. students
	Serving/served on thesis committees of 5 current / 29 former PhD students
	Advised research projects for 3 M.S. students
	Advised research projects for 18 undergrad and REU students

JOURNAL PUBLICATIONS (advised students underlined, post-docs italicized)

Google Scholar: Mark Flanner (total citations: >25,000; h-index: 59)
Web of Science: C-6139-2011 (total citations: >17,000; h-index: 52)
ORCID: 0000-0003-4012-174X

93) He, C., **Flanner, M.**, Lawrence, D. M., and Gu, Y. (2024), New features and enhancements in community land model (CLM5) snow albedo modeling: Description, sensitivity, and evaluation, *Journal of Advances in Modeling Earth Systems*, 16, e2023MS003861, doi: 10.1029/2023MS003861.

92) Gerlein-Safdi, C., P. Köhler, S. Wang, **M. Flanner**, G. Keppel-Aleks and C. Frankenberg (2023),

Algae Blooms on the Greenland Ice Sheet Detected Through Solar-Induced Fluorescence, I*EEE Trans. Geosci. Remote Sens.*, 61, 1-9, 4302309, doi: 10.1109/TGRS.2023.3305194.

91) Bonilla, E. X, L. J. Mickley, E. G. Beaudon, L. G. Thompson, W. E. Rodriguez, R. Cruz Encarnación, C. A. Whicker, **M. G. Flanner**, C. G. Schmitt, and P. Ginot (2023), Contribution of biomass burning to black carbon deposition on Andean glaciers: consequences for radiative forcing, *Environ. Res. Lett.*, 18, 024031, doi: 10.1088/1748-9326/acb371.

90) Whaley, C. H., Law, K. S., Hjorth, J. L., Skov, H., Arnold, S. R., Langner, J., Pernov, J. B., Bergeron, G., Bourgeois, I., Christensen, J. H., Chien, R.-Y., Deushi, M., Dong, X., Effertz, P., Faluvegi, G., **Flanner, M.**, Fu, J. S., Gauss, M., Huey, G., Im, U., Kivi, R., Marelle, L., Onishi, T., Oshima, N., Petropavlovskikh, I., Peischl, J., Plummer, D. A., Pozzoli, L., Raut, J.-C., Ryerson, T., Skeie, R., Solberg, S., Thomas, M. A., Thompson, C., Tsigaridis, K., Tsyro, S., Turnock, S. T., von Salzen, K., and Tarasick, D. W. (2023), Arctic tropospheric ozone: assessment of current knowledge and model performance, *Atmos. Chem. Phys.*, 23, 637–661, doi: 10.5194/acp-23-637-2023.

89) von Salzen, K., C. H. Whaley, S. C. Anenberg, R. Van Dingenen, Z. Klimont, **M. G. Flanner**, R. Mahmood, S. R. Arnold, S. Beagley, R.-Y. Chien, J. H. Christensen, S. Eckhardt, A. M. L. Ekman, N. Evangeliou, G. Faluvegi, J. S. Fu, M. Gauss, W. Gong, J. L. Hjorth, U. Im, S. Krishnan, K. Kupiainen, T. Kühn, J. Langner, K. S. Law, L. Marelle, D. Olivié, T. Onishi, N. Oshima, V.-V. Paunu, Y. Peng, D. Plummer, L. Pozzoli, S. Rao, J.-C. Raut, M. Sand, J. Schmale, M. Sigmond, M. A. Thomas, K. Tsigaridis, S. Tsyro, S. T. Turnock, M. Wang, and B. Winter (2022), Clean air policies are key for successfully mitigating Arctic warming, *Commun. Earth Environ.*, 3, 222, doi: 10.1038/s43247-022-00555-x.

88) Fair, Z., **Flanner, M.**, Schneider, A., and Skiles, S. M. (2022), Sensitivity of modeled snow grain size retrievals to solar geometry, snow particle asphericity, and snowpack impurities, *The Cryosphere*, 16, 3801–3814, doi: 10.5194/tc-16-3801-2022.

87) Whaley, C. H., Mahmood, R., von Salzen, K., Winter, B., Eckhardt, S., Arnold, S., Beagley, S., Becagli, S., Chien, R.-Y., Christensen, J., Damani, S. M., Dong, X., Eleftheriadis, K., Evangeliou, N., Faluvegi, G., **Flanner, M.**, Fu, J. S., Gauss, M., Giardi, F., Gong, W., Hjorth, J. L., Huang, L., Im, U., Kanaya, Y., Krishnan, S., Klimont, Z., Kühn, T., Langner, J., Law, K. S., Marelle, L., Massling, A., Olivié, D., Onishi, T., Oshima, N., Peng, Y., Plummer, D. A., Popovicheva, O., Pozzoli, L., Raut, J.-C., Sand, M., Saunders, L. N., Schmale, J., Sharma, S., Skeie, R. B., Skov, H., Taketani, F., Thomas, M. A., Traversi, R., Tsigaridis, K., Tsyro, S., Turnock, S., Vitale, V., Walker, K. A., Wang, M., Watson-Parris, D., and Weiss-Gibbons, T. (2022), Model evaluation of short-lived climate forcers for the Arctic Monitoring and Assessment Programme: a multi-species, multi-model study, *Atmos. Chem. Phys.*, 22, 5775–5828, doi: 10.5194/acp-22-5775-2022.

86) Brown, H., Wang, H., **Flanner, M.**, Liu, X., Singh, B., Zhang, R., Yang, Y., and Wu, M. (2022), Brown carbon fuel and emission source attributions to global snow darkening effect, *J. Adv. Model. Earth Syst.*, 14, e2021MS002768, doi: 10.1029/2021MS002768.

85) Whicker, C. A., **Flanner, M. G.**, Dang, C., Zender, C. S., Cook, J. M., and Gardner, A. S. (2022), SNICAR-ADv4: a physically based radiative transfer model to represent the spectral albedo of glacier ice, *The Cryosphere*, 16, 1197–1220, doi: 10.5194/tc-16-1197-2022.

84) **Flanner, M. G.**, Arnheim, J. B., Cook, J. M., Dang, C., He, C., Huang, X., Singh, D., Skiles, S. M., Whicker, C. A., and Zender, C. S. (2021), SNICAR-ADv3: a community tool for modeling spectral snow albedo, *Geosci. Model Dev.*, 14, 7673–7704, doi: 10.5194/gmd-14-7673-2021.

83) Ward, J. L., **Flanner, M. G.**, and Dunn-Sigouin, E. (2020), Impacts of Greenland block location on clouds and surface energy fluxes over the Greenland Ice Sheet. *J. Geophys. Res. Atmos.*, 125, e2020JD033172, doi:10.1029/2020JD033172.

82) Fair, Z., **Flanner, M.**, Brunt, K. M., Fricker, H. A., and Gardner, A. S. (2020), Using ICESat-2 and Operation IceBridge altimetry for supraglacial lake depth retrievals, *The Cryosphere*, 14, 4253–4263, doi: 10.5194/tc-14-4253-2020.

81) Snide, C. E., L. Gilbert, A. Meyer, P. Samson, **M. Flanner**, and J. Bassis (2020), Seeing the Greenland Ice Sheet through students' eyes, *Eos*, 101, doi:10.1029/2020EO139739.

80) Cook, J. M., Tedstone, A. J., Williamson, C., McCutcheon, J., Hodson, A. J., Dayal, A., Skiles, M., Hofer, S., Bryant, R., McAree, O., McGonigle, A., Ryan, J., Anesio, A. M., Irvine-Fynn, T. D. L., Hubbard, A., Hanna, E., **Flanner, M.**, Mayanna, S., Benning, L. G., van As, D., Yallop, M., McQuaid, J. B., Gribbin, T., and Tranter, M. (2020), Glacier algae accelerate melt rates on the south-western Greenland Ice Sheet, *The Cryosphere*, 14, 309–330, doi:10.5194/tc-14-309-2020.

79) Wang, H., R. C. Easter, R. Zhang, P.-L. Ma, B. Singh, K. Zhang, D. Ganguly, P. J. Rasch, S. M. Burrows, S. J. Ghan, S. Lou, Y. Qian, Y. Yang, Y. Feng, **M. Flanner**, R. L. Leung, X. Liu, M. Shrivastava, J. Sun, Q. Tang, S. Xie, J.-H. Yoon (2020), Aerosols in the E3SM Version 1: New developments and their impacts on radiative forcing, *J. Adv. Model. Earth Syst.*, 12, e2019MS001851, doi:10.1029/2019MS001851.

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77) Dang, C., Zender, C. S., and **Flanner, M. G.** (2019), Intercomparison and improvement of two-stream shortwave radiative transfer schemes in Earth system models for a unified treatment of cryospheric surfaces, *The Cryosphere*, 13, 2325–2343, doi:10.5194/tc-13-2325-2019, 2019.

76) Chen, Y.-H., X.L. Huang, X. H. Chen, and **M. G. Flanner** (2019), The Effects of Surface Longwave Spectral Emissivity on Atmospheric Circulation and Convection over the Sahara and Sahel, *J. Climate*, 32(15), 4873-4890, doi:10.1175/JCLI-D-18-0615.1.

75) Schneider, A., **Flanner, M.**, De Roo, R., and Adolph, A. (2019), Monitoring of snow surface near-infrared bidirectional reflectance factors with added light-absorbing particles, *The Cryosphere*, 13, 1753-1766, doi:10.5194/tc-13-1753-2019.

74) Rasch, P. J., S. Xie, P.-L. Ma, W. Lin, H. Wang, Q. Tang, S. M. Burrows, P. Caldwell, K. Zhang, R. C. Easter, P. Cameron-Smith, B. Singh, H. Wan, J.-C. Golaz, B. E. Harrop, E. Roesler, J. Bacmeister, V. E. Larson, K. J. Evans, Y. Qian, M. Taylor, L. R. Leung, Y. Zhang, L. Brent, M. Branstetter, C. Hannay, S. Mahajan, A. Mametjanov, R. Neale, J. H. Richter, J.-H. Yoon, C. S. Zender, D. Bader, **M. Flanner**, J. G. Foucar, R. Jacob, N. Keen, S. A. Klein, X. Liu, A.G. Salinger, M. Shrivastava, Y. Yang (2019), An Overview of the Atmospheric Component of the Energy Exascale Earth System Model, *J. Adv. Model. Earth Syst.*, 11, 2377– 2411, doi:10.1029/2019MS001629.

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Mametjanov, J. L. McClean, R. B. McCoy, R. B. Neale, S. F. Price, Y. Qian, P. J. Rasch, J. E. J. R. Eyre, W. J. Riley, T. D. Ringler, A. F. Roberts, E. L. Roesler, A. G. Salinger, Z. Shaheen, X. Shi, B. Singh, J. Tang, M. A. Taylor, P. E. Thornton, A. K. Turner, M. Veneziani, H. Wan, H. Wang, S. Wang, D. N. Williams, P. J. Wolfram, P. H. Worley, S. Xie, Y. Yang, J.-H. Yoon, M. D. Zelinka, C. S. Zender, X. Zeng, C. Zhang, K. Zhang, Y. Zhang, X. Zheng, T. Zhou, Q. Zhu (2019), The DOE E3SM coupled model version 1: Overview and evaluation at standard resolution, *J. Adv. Model. Earth Syst.*, 11, 2089– 2129, doi:10.1029/2018MS001603.

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71) Krinner, G., Derksen, C., Essery, R., **Flanner, M.**, Hagemann, S., Clark, M., Hall, A., Rott, H., Brutel-Vuilmet, C., Kim, H., Ménard, C. B., Mudryk, L., Thackeray, C., Wang, L., Arduini, G., Balsamo, G., Bartlett, P., Boike, J., Boone, A., Chéruy, F., Colin, J., Cuntz, M., Dai, Y., Decharme, B., Derry, J., Ducharne, A., Dutra, E., Fang, X., Fierz, C., Ghattas, J., Gusev, Y., Haverd, V., Kontu, A., Lafaysse, M., Law, R., Lawrence, D., Li, W., Marke, T., Marks, D., Ménégoz, M., Nasonova, O., Nitta, T., Niwano, M., Pomeroy, J., Raleigh, M. S., Schaedler, G., Semenov, V., Smirnova, T. G., Stacke, T., Strasser, U., Svenson, S., Turkov, D., Wang, T., Wever, N., Yuan, H., Zhou, W., Zhu, D. (2018), ESM-SnowMIP: assessing snow models and quantifying snow-related climate feedbacks, *Geosci. Model Dev.*, 11, 5027-5049, doi: 10.5194/gmd-11-5027-2018.

70) *Li, Y.* and **Flanner, M. G.** (2018), Investigating the impact of aerosol deposition on snowmelt over the Greenland Ice Sheet using a large-ensemble kernel, *Atmos. Chem. Phys.*, 18, 16005-16018, doi:10.5194/acp-18-16005-2018.

69) Skiles, S. M., **Flanner, M.**, Cook, J. M., Dumont, M., and Painter, T. H. (2018), Radiative forcing by light-absorbing particles in snow, *Nature Climate Change*, 8, 964-97, doi:10.1038/s41558-018-0296-5.

68) Krinner, G. and **Flanner, M. G.** (2018), Striking stationarity of large-scale climate model bias patterns under strong climate change, *Proc. Nat. Acad. Sci.*, 115, 38, 9462–9466, doi: 10.1073/pnas.1807912115.

67) He, C., **Flanner, M. G.**, Chen, F., Barlage, M., Liou, K. N., Kang, S., Ming, J., and Qian, Y. (2018), Black carbon-induced snow albedo reduction over the Tibetan Plateau: uncertainties from snow grain shape and aerosol–snow mixing state based on an updated SNICAR model, *Atmos. Chem. Phys.*, 18, 11507-11527, doi:10.5194/acp-18-11507-2018.

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