

## *Curriculum Vitae*

***Atul K. Jain***

Professor

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### ***Professional Address***

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### **Educational Background and Professional Experience**

#### *Education Background*

B.Sc. (Physics, Chemistry and Mathematics) Meerut University, India, 1980

M.Sc. (Mathematics) Meerut University, India, 1983

Ph.D. (Atmospheric Sciences) Indian Institute of Technology, New Delhi, India, 1988

#### *Professional Experience*

January 1988–December, 1990

Research Associate, Center for Applied Climatology and Environmental Studies, Department of Geography, University of Münster, D-4400 Münster, Germany.

January 1991–December 1992

Senior Research Associate, Center for Applied Climatology and Environmental Studies, Department of Geography, University of Münster, D-4400 Münster, Germany.

January 1993–November 1994

Post Doctoral Research Staff Member, Global Climate Research Division, Lawrence Livermore National Laboratory, Livermore, CA 94550, USA.

December 1994 - May 2000

Assistant Research Professor/Research Scientist, Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, IL, USA.

June 2000 – July 2002

Associate Research Professor, Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, IL, USA.

January 2001 - May 2001

Associate Research Professor, Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, IL, USA.

January 2002 – May 2002

Visiting Lecturer, Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, IL, USA.

August 2002 – August 2006

Assistant Professor, Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, IL, USA.

August 2006 – August 2010

Associate Professor, Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, IL, USA.

August 2010 – Cont.

Professor, Department of Atmospheric Sciences, University of Illinois at Urbana-Champaign, IL, USA.

January 2004-present

Faculty Affiliate, Program in Ecology and Evolutionary Biology, University of Illinois at Urbana-Champaign, IL, USA.

August 2015-present

Faculty Affiliate, Illinois Informatics – Program Area: Spatial Informatics, University of Illinois at Urbana-Champaign, IL, USA.

### **Honors, Recognitions, and Outstanding Achievements**

Invited Expert<sup>s</sup>, Dahlen Workshop on Limiting The Greenhouse Effect: Options for Controlling Atmospheric CO<sub>2</sub> Accumulation, Berlin, Dec. 9-14, 1990.

Invited Expert<sup>s</sup>, Second United Nations Framework Convention on Climate Change (UNFCCC) Expert Meeting on “*The Scientific and Methodological Assessment of Contributions to Climate Change*”, Bracknell, UK, Sept. 25-27, 2002.

Recipient of the *National Science Foundation Career Award*, March 2003.

Invited Expert<sup>s</sup>, Department of Energy (DOE) workshop on *Integrated Assessment: Characterizing Key Policy Issues*, June 28-29, 1994.

Invited Expert<sup>s</sup>, Third United Nations Framework Convention on Climate Change (UNFCCC) Expert Meeting on “*The Scientific and Methodological Assessment of Contributions to Climate Change*”, Berlin, Germany, Sept. 9-8, 2003.

Invited to brief Swiss “Environmental Expert” group (including parliamentarians, NGOs, trade groups) on climate sensitivity and uncertainty, *The US Department of State*, Chicago, IL, October 30, 2003.

Invited Expert<sup>s</sup>, Fourth Expert Meeting on the scientific and methodological aspects of the proposal by Brazil / MATCH, Cologne, Germany, 6-7 May, 2004.

Invited Participant, 2004 *Beckman Frontier of Sciences Symposium*, US National Academy of Sciences, Irvine, CA.

Nominated *Dean’s Teaching Fellow for AY 2004/2005*

Appointed *Center for Advance Studies Fellow for AY 2005/2006*

*Incomplete List of Teachers Ranked as Excellent*, Fall 2005, for ENVS 301

Invited Expert<sup>s</sup>, Sixth Expert Meeting on the scientific and methodological aspects of the proposal by Brazil / MATCH, Louvain-La-Neuve, Belgium, March 13-14, 2006.

*Incomplete List of Teachers Ranked as Excellent*, Fall 2006, for ENVS 301.

*List of Teachers Ranked as Excellent*, Fall 2007, for ENVS 301.

*2007 Nobel Peace Prize*, shared based on work with Intergovernmental Panel on Climate Change

Invited Panelist for a panel discussion on global warming at the *21<sup>st</sup> Annual Environmental Conference and Expo*, Iowa-Illinois Safety Council, Stony Creek Inn, Moline, IL, September 27, 2007

Invited to participate as a keynote speaker at the *First Global Summit on Sustainable Development and Biodiversity 2008*, to be held in India, Dec 10-12, 2008.

Appointed *National Center for Super Computing Application (NCSA) Fellow for AY 2008/2009*

Appointed a member of the *NASA-LCLUC (Land Cover and Land Use Change) Science Team (2008-cont.)*.

Appointed a member of the *NASA-MAIRS (Monsoon Asia Integrated Regional Study) Science Team (2008-cont.)*.

- Elected a representative from electoral group VII for service on *the UIUC LAS Council on General Education* (AY 2008-cont.).
- Received *Green Ambassador of India Award* for a contribution towards promoting Global Agenda for ecological health of the Planet through Research and Scientific Contribution, First Global Summit on Sustainable Development and Biodiversity 2008, Raipur, Chhattisgarh, India, February 7-9, 2009.
- Delivered a keynote talk at the *American Physical Society/Ohio-Region Section Meeting (OSAPS)*, Youngstown State University, Youngstown, OH, March 28, 2008.
- Delivered a keynote talk at the *First Global Summit on Sustainable Development and Biodiversity* (GLOSS 2008), Raipur, Chhattisgarh, India, February 7-9, 2009.
- UIUC reorganization on the *Nobel Laureate page of the University of Illinois website* (<http://illinois.edu/about/overview/facts/nobel.html>) of 2007 Nobel Peace Prize that I shared based on work with Intergovernmental Panel on Climate Change.
- Invited Discussion Panelist, *First Annual Integrated Assessment Modeling Group meeting*, NCAR, Boulder, CO., August 4-5, 2010.
- Invited to deliver a series of lectures at *the United Nations (UN) Center for Space Science and Technology for Asia Pacific*, Dehradun, India, December 5-8, 2010.
- Invited Discussion Panelist, *Advancing Land-use Modeling and Analysis for Carbon Cycling Studies Workshop*, Princeton University, Princeton, NJ, May 17-19, 2011.
- Invited Discussion Panelist, *Societal Dimensions of Earth System Modeling Workshop*, Organized by NCAR to identify the types of activities that a Societal Dimensions working group could undertake and their potential benefits to the community, NCAR, Boulder, CO, May 25-26, 2011.
- Appointed Member, *National Academy of Sciences Committee on Needs and Research Requirements for Land-Change Modeling*, October 2011 – December 2012.
- Invited to give a series of lectures at *the United Nations (UN) Center for Space Science and Technology for the Asia Pacific*, Dehradun, India, November 18-26, 2011.
- Invited Author<sup>s</sup>, *National Academic of Sciences report entitled “Advancing Land Change Modeling: Opportunity and Research Requirements,”* National Academy Press, 500 Fifth Street, N.W., Lockbox 285, Washington, DC 20055 (Published in 2014).
- International Steering Committee Member, NASA Sponsored *Land Cover/Land Use Change SARI International Regional Science Meeting in South/Southeast Asia*, Philippines, 28-30th May 2018.
- International Steering Committee Member, NASA Sponsored *Land Use/Cover Changes, Environment and Emissions in South/Southeast Asia – An International Regional Science Meeting*, Johor Bahru, Malaysia, 22-24th July, 2019.
- Co-hosted a Training for the young scientists as a part of NASA LCLUC & South/Southeast Asia Research Initiative, *Remote Sensing and Geospatial Technologies for LCLUC Studies*, Universiti Teknologi, Malaysia, 25-27 July, 2019.
- Appointed to Lead GHG emissions budget synthesis for South Asia Region for *REgional Carbon Cycle Assessment and Processes-2 (RECCAP2) Project*, A Global Research Project of Future Earth, and a Research Partner of the World Climate Research Programme (WCRP).
- Invited Panelist, Asian Space Agencies and LCLUC Overviews for South and Southeast Asia, *NASA LCLUC Virtual Science Team Meeting*, 9-22 October 2020.
- Being Named to the *Reuters World’s Top 1000 Climate Scientists List* (April 2021): <https://www.reuters.com/investigates/special-report/climate-change-scientists-list/>

<sup>\$</sup>*These meetings, for which I was invited expert, are convened by government or international agencies to develop policy based upon the best scientific information.*

### IPCC Authorship

- Contributing Author, IPCC Report *Climate Change 1994: Radiative Forcing of Climate Change*, 1995.
- Contributing Author, IPCC Report *Climate Change 1995: The Science of Climate*, 1996.
- Lead Author, IPCC Report “*Implications of Proposed CO<sub>2</sub> Emissions Limitations*”, 1997.
- Contributing Author, IPCC Report *Implications of Proposed CO<sub>2</sub> Emissions Limitations*, 1997.
- Lead Author, IPCC Report *An Introduction to Simple Climate Models used in the IPCC Second Assessment Report*, 1997.
- Contributing Author, IPCC Report *Aviation and The Global Atmosphere*, 1999.
- Contributing Author, IPCC Report *Climate Change 2001: The Scientific Basis*, 2001.
- Contributing Author, IPCC WG I 5<sup>th</sup> AR, *Climate Change 2013: The Physical Science Basis*”, 2013.
- Contributing Author, IPCC WG III 5<sup>th</sup> AR, *Climate Change 2013: Mitigation of Climate Change*”, 2014

### Review Panelist

- NASA Review Panelist for NRA-03-OES-03, *Interdisciplinary Science in the NASA Earth Science Enterprise*, June 2003.
- Invited Review Panelist, *NSF peer review panel for Integrative Research and Education Traineeship Program (IGERT)*, Arlington VA, June 1-2, 2009.
- Invited Review Panelist, *U.S. Department of State/National Academies Review Panel for the Pakistan-U.S. Science and Technology Cooperative Program*, National Academic of Sciences, Washington, DC, June 16-17, 2010.
- Invited Review Panelist, U.S. Department of Energy (DOE) review panel to evaluate *Lawrence Berkley National Laboratory’s (LBNL) Climate Science Plan*, LBNL, Berkley, CA, September 8-9, 2010.
- Invited Review Panelist, *U.S. Department of Energy (DOE) Review Panel on Next Generation Ecosystem Experiment (NGEE)*, Arlington, Virginia, Aug 3-4, 2011.
- Invited Review Panelist, *U.S. NASA Review Panel on Interdisciplinary Research in Earth Science (IDS)*, Bethesda, MD, March 1-2, 2012.
- Invited Review Panelist, *U.S. NASA Review Panel on Modeling, Analysis and Prediction (MAP) program*, Teleconference, January 28, 2013.
- Invited Review Panelist, *U.S. Department of Energy (DOE) Review Panel on Earth System Modeling (ESM) and Terrestrial Ecosystem Sciences (TES)*, Washington, DC, March 4, 2013.
- Invited Review Panelist, *U.S. Department of State/National Academies Review Panel for the Pakistan-U.S. Science and Technology Cooperative Program*, National Academic of Sciences, Washington, DC, May 16-17, 2013.
- Invited Review Panelist, *U.S. Department of Energy Early Career Panel Review for Climate and Environmental Science Division*, Gaithersburg, MD, Feb 8-9, 2015.
- Invited Review Panelist, *U.S. Department of State/National Academies Review Panel for the Pakistan-U.S. Science and Technology Cooperative Program*, National Academic of Sciences, April 20, 2015.

- Invited Review Panelist, *U.S. Department of Energy Early Career Panel Review for Climate and Environmental Science Division Research Program*, in the topic area of “Human Component in Climate Models”, February 19, 2016.
- Invited Review Panelist, *U.S. NASA Review Panel on Modeling, Analysis and Prediction (MAP) program*, Teleconference, September 26, 2016.
- Invited Review Panelist, *U.S. National Science Foundation (NSF) EPSCoR Site Visit to Review the Oklahoma EPSCoR Research Infrastructure Improvement (RII) Track-1 Project*, Oklahoma State University, Stillwater, OK, September 20-22, 2016.
- Invited Advisory Panelist, *U.S. National Science Foundation (NSF) Macro Systems Biology and Early NEON Science Panel*, Arlington, VA, 2017, March 7-19, 2017.
- Invited Review Panelist, *U.S. Department of Energy SciDAC (Scientific Discovery through Advanced Computing): Scientific Computation Application Partnerships in Earth System Science II – Pilot Projects*, Washington DC, May 3-4, 2017.
- Invited Advisory Panelist, *U.S. Department of Energy Earth System Model, ACME, Advisory Group – Biogeochemistry Model Intercomparison, September 1, 2017 – January 30, 2018*.
- Invited Review Panelist, *U.S. Department of Energy Earth System Model (ESM) Development and Analysis*, Rockville, MD, May 22, 2018.
- Invited Review Panelist, *U.S. Department of Energy Regional Global Climate Modeling (RGCM)*, Rockville, MD, May 23-24, 2018.
- Invited Review Panelist, *U.S. Department of Energy Early Career Research Program*, Panel discussion conducted via Zoom web conferencing, April 30-May 1, 2020.

#### Conference/Workshop Chair

- Session Chair, *Fall 1995 American Geophysical Union (AGU) Meeting* titled Global Carbon Cycle's Role in Global Change II, Dec. 11-15, 1995.
- Session Chair, *Fall 1995 American Geophysical Union (AGU) Meeting*, session titled “Global Carbon Cycle's Role in Global Change”, San Francisco, CA, Dec. 11-15, 1995.
- Session Chair, *Spring 1996 American Geophysical Union (AGU) Meeting*, session titled “Global Carbon Cycle's Role in Global Change”, Baltimore, MD, May 20-24, 1996.
- Session Chair, *Intl. Conference on Climate Change and Environmental Policy*, session titled “The Role of Agriculture in Mitigating Climate Change”, University of Illinois @ Urbana-Champaign, Nov 11-12, 2002.
- Session Chair, *Intl. Conference on Climate Change and Environmental Policy*, session titled “The Role of Agriculture in Mitigating Climate Change”, University of Illinois @ Urbana-Champaign, Nov 11-12, 2002.
- Session Chair, *Fall 2007 American Geophysical Union (AGU) Meeting*, session titled “The Role of Climate, Carbon and Limiting Nutrient Cycles and Human Activities in Terrestrial Ecosystems”, San Francisco, CA, Dec. 10-14, 2007.
- Session Chair, *Fall 2008 American Geophysical Union (AGU) Meeting*, session title “Impact on Terrestrial Ecosystems of CO<sub>2</sub>, Climate, Limiting Nutrients, Human Activities, and Biofuel Production" at 2008 FALL AGU Meeting”, San Francisco, CA, Dec. 15-19, 2008.
- Session Chair, *Fall 2009 American Geophysical Union (AGU) Meeting*, session title “The Role of Climate, Carbon and Limiting Nutrient Cycles and Human Activities in the Terrestrial Ecosystems”, San Francisco, CA, Dec. 14-18, 2009.

- Session Chair, *Fall 2010 American Geophysical Union (AGU) Meeting*, session title “Improving predictions of the global carbon cycle and climate: New mechanisms, feedback loops and approaches for model evaluation”, San Francisco, CA, Dec. 13-17, 2010.
- Session Chair, *Fall 2010 American Geophysical Union (AGU) Meeting*, session title “Attribution of the Change in CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O Atmospheric Abundances to Historical, National, and Natural Emissions”, San Francisco, CA, Dec. 13-17, 2010.
- Session Chair, *Fall 2011 American Geophysical Union (AGU) Meeting*, session title “Improving predictions of the global carbon cycle and climate: New mechanisms, feedback loops and approaches for model evaluation”, San Francisco, CA, Dec. 5-9, 2011.
- Session Chair, *National Research Council Workshop - Needs and Research for Land Change Modeling*, session title “Land-Climate Interactions”, Chapel Hill, NC, February 15-17, 2012.
- Session Chair, *Fall 2012 American Geophysical Union (AGU) Meeting*, session title “Improving predictions of the global carbon cycle and climate: New mechanisms, feedback loops and approaches for model evaluation”, San Francisco, CA, Dec. 3-7, 2012.
- Session Chair, Workshop on *Land Cover and Land Use Change Dynamics and their Impacts in South Asia*, session title “LCLUC Forestry and Carbon Cycle”, Karunya University, Coimbatore, India, January 7-14, 2013.
- Session Chair, *9<sup>th</sup> International Carbon Dioxide Conference*, session title “Past and Present Changes and Variability”, Beijing, China, June 3-7, 2013.
- Session Chair, *Fall 2013 American Geophysical Union (AGU) Meeting*, session title “Improving predictions of the global carbon cycle and climate: New mechanisms, feedback loops and approaches for model evaluation”, San Francisco, CA, Dec. 9-13, 2013.
- Session Chair, *Global Change Research Symposium Human and Ecosystem Response to Global Change Evidence and Application*, session title “Coupled Human and Natural System”, Brindisi/Ostuni, Italy, Sept 16-18, 2014.
- Session Chair, *Fall 2014 American Geophysical Union (AGU) Meeting*, session title “Improving predictions of the global carbon cycle and climate: New mechanisms, feedback loops and approaches for model evaluation”, San Francisco, CA, Dec. 15-19, 2014.
- Session Chair, *iSEE Congress 2015: Water Planet, Water Crises? Meeting the World’s Water-Food-Energy Needs Sustainably*, session title “Vulnerability of Water Resources to Climate Change”, Urbana, IL, Sept 14-16, 2015.
- Session Chair, *Asiaflux Workshop 2015: Challenges and Significance of Ecosystem Research in Asia to Better Understand Climate Change*, session title “The role of climate, carbon cycle and human activities in tropical ecosystem”s, Pune, India, Nov. 22-29, 2015.
- Session Chair, *Fall 2015 American Geophysical Union (AGU) Meeting*, session title “Improving predictions of the global carbon cycle and climate: New mechanisms, feedback loops and approaches for model evaluation”, San Francisco, CA, Dec. 13-18, 2015.
- Session Chair, *International Land Model Benchmarking (ILAMB) Workshop in the U.S*, session title “CMIP6 Evaluation Priorities: Land Use Model Intercomparison Project (LUMIP)”, Washington DC, May 16–18, 2016.
- Session Chair, *Fall 2016 American Geophysical Union (AGU) Meeting*, session title “Improving predictions of the global carbon cycle and climate: New mechanisms, feedback loops and approaches for model evaluation”, San Francisco, CA, Dec. 12-16, 2016.
- Session Chair, *Asia Oceania Geosciences Society (AOGS) Meeting*, session title “Modeling the interactions between global biogeochemical cycle and the Earth’s climate system”, Singapore, 6-11 August, 2017.

Session Chair, *Fall 2017 American Geophysical Union (AGU) Meeting*, session title “Integrated Understanding of Climate, Carbon, Nutrient Cycles, Human Activities, and their Interactions in Terrestrial Ecosystems”, New Orleans, LA, 11-15 December 2017.

Session Chair, *Asia Oceania Geosciences Society (AOGS) Meeting*, the session titled “Modeling the interactions between global biogeochemical cycle and the Earth’s climate system”, Honolulu, Hawaii, June 3-8, 2018.

Session Chair, *Fall 2018 American Geophysical Union (AGU) Meeting*, session title “Integrated Understanding of Climate, Carbon, Nutrient Cycles, Human Activities, and their Interactions in Terrestrial Ecosystems”, Washington, DC, 10-114 December 2018.

Session Chair, *Asia Oceania Geosciences Society (AOGS) Meeting*, the session titled “Modeling the interactions between global biogeochemical cycle and the Earth’s climate system,” Singapore, July 28- Aug 2, 2019.

Session Chair, *Fall 2020 American Geophysical Union (AGU) Meeting*, session title “Sustainability in FEW Nexus Systems Through Novel Interdisciplinary Research Advances, Earth Observations, and Policy Science for Adaptation Strategies”, Online Meeting, 1-17 December 2020

### **Membership in Professional Societies**

Member, American Geophysical Union (AGU)

Member, American Meteorological Society (AMS)

Member, American Association for the Advancement of Science (AAAS)

Member, European Geophysical Union (EGU)

### **Editorships of Journals or Other Learned Publications**

*Associate Editor*, International Journal of Integrated Energy Systems, July 2008 – Cont.

*Editorial Board Member*, Remote Sensing, open access journal, January 2019 – Cont.

*Editorial Board Member*, Journal Earth Science India (eISSN: 0974 – 8350), January 2011 – Cont. 2011.

*Editorial Board Member*, Agronomy – An Open Access Journal, January 2015 – Cont.

### **Financial Grants and Contracts Received**

Awarded grants and contracts totaling approximately \$25 million from the following sources since appointed to the University of Illinois:

*Electric Power Research Institute (EPRI)*

*Energy Bioscience Institute (EBI), University of Illinois (UIUC)*

*Environmental Council Earth and Society Initiative, University of Illinois (UIUC)*

*National Center for Super Computing Applications (NCSA), University of Illinois (UIUC)*

*The U.S. Department Of Energy (DOE)*

*The U.S. Environmental Protection Agency (EPA)*

*The U. S National Aeronautics and Space Administration (NASA)*

*The U. S National Science Foundation (NSF)*

*The U.S. Department Of Agriculture (USDA)*

The U.S. Geological Survey (USGS)

## Research Publications

Graduate student <sup>G</sup> or postdoc <sup>P</sup> in Jain's lab is the lead author/contributor.

### Articles in Journals

According to google scholar, there are 28,671 total citations to my work with an H-index of 66. In the year 2020 alone, there were more than 3851 citations, and this year (2021) so far my work has been cited by 3300 times (last checked on September 11, 2021)

(<https://scholar.google.com/citations?user=AiFaZvYAAAAJ&hl=en>)

#### **1985-1999**

- Lal M. and **AK Jain** (1985), The effect of atmospheric aerosols on earth's climate as calculated with 1-D radiative-convective model, *Proc. Indian National Science Academy*, 51 (4A), 735-740.
- Jain AK**, M Lal and MC Sinha (1986), On the meridional variation of climatic changes due to doubling of CO<sub>2</sub> content in the atmosphere, *Theoretical and Applied Climatology*, 37, 15-20.
- Lal, M., **A.K. Jain** and M.C. Sinha (1987), Possible climate implications of depletion of Antarctic ozone, *Tellus*, 39B, 326-328.
- Lal M and **AK Jain** (1988), Climatic effect of observed changes in atmospheric trace gases at Antarctica, *Atmospheric Environment*, 22, 2047-48.
- Bach W. and **AK Jain** (1990), CFC greenhouse potential of scenarios possible under the Montreal Protocol, *Intl. J. Climatology*, 10, pp 439-450.
- Bach W and **AK Jain** (1991), Towards Climate Conventions Scenario Analysis for a Climatic Protection Policy, *Ambio*, 20, 322-329.
- Bach W and **AK Jain** (1992), Climate and Ecosystem Protection Requires Burden Sharing: The Specific Task After Rio (I), *Prospective in Energy*, 2, 67-93.
- Bach W and **AK Jain** (1993), Climate and Ecosystem Protection Requires Binding Emission Targets: The Specific Task After Rio(II), *Prospective in Energy*, 2/3, 173-214.
- Jain AK** and W Bach (1994), The effectiveness of measures to reduce the man-made greenhouse effect: the application of a climate-policy-model, *Theoretical and Applied Climatology*, 49, 103-118.
- Jain AK**, HS Keshgi, MI Hoffert, and DJ Wuebbles (1995), Distribution of Radiocarbon as a Test of Global Carbon Cycle Models, *Global Biogeochemical Cycles*, 9, 153-166.
- Wuebbles DJ, **AK Jain**, K.O. Patten, and KE Grant (1995), Sensitivity of Direct Global Warming Potentials to Uncertainties, *Climatic Change*, 29, 265-297.
- Hammitt JK, **AK Jain**, JL Adams, and DJ Wuebbles (1996), A welfare-based "Economic-Damage Index" for comparing greenhouse-gas emissions, *Nature*, 381, 301-303.
- Hammitt JK, **AK Jain**, DJ Wuebbles, and JL Adams, JL (1996), Costing the earth, *Nature*, 383, 571.
- Jain AK**, HS Keshgi, and DJ Wuebbles (1996), A globally Aggregated Reconstruction of Cycles of Carbon and its Isotopes, *Tellus*, 48B, 583-600.
- Keshgi HS, **AK Jain**, and DJ Wuebbles (1996), Accounting for the Missing Sink with the CO<sub>2</sub> Fertilization Effect, *Climatic Change*, 33, 31-62.
- Jain A.K.**, HS Keshgi, and DJ Wuebbles (1997), Is there an imbalance in the global budget of bomb-produced radiocarbon? *J. Geophys. Res.*, 102, 1327-1333.
- Good DA, JS Francisco, **AK Jain**, and DJ Wuebbles (1998), Lifetimes and global warming potentials for Dimethyl Ethers and for Fluorinated Ethers: CH<sub>3</sub>OCF<sub>3</sub> (E143a), CHF<sub>2</sub>OCF<sub>2</sub> (E134), CHF<sub>2</sub>OCF<sub>3</sub> (E125), *J. Geophys. Res.*, 103, 28,181-28,186.
- Hayhoe K., **A Jain** and D Wuebbles (1998), Trade-Offs in Fossil Fuel Use: The Effects of CO<sub>2</sub>, CH<sub>4</sub> and SO<sub>2</sub> Aerosol Emissions on Climate, *World Resources Review*, 10, 321-333.



- Hoffert MI, K Caldeira, **AK Jain**, EF Haites, LDD Harvey, SD Potter, ME Schlesinger, SH Schneider, RG Watts, TML Wigley, and DJ Wuebbles (1998), Energy Implications of CO<sub>2</sub> Stabilization, *Nature*, 395, 881-884.
- Wuebbles DJ, **AK Jain**, KO Patten, and PS Connell (1998), Evaluation of ozone depletion potentials for chlorobromomethane (CH<sub>2</sub>ClBr) and 1-Bromo-Propane (C<sub>3</sub>H<sub>7</sub>Br), *Atmospheric Environment*, 32, 107-113.
- Calm JM, DJ Wuebbles, and **AK Jain** (1999), Impacts on global ozone and climate from use and emissions of 2,2-dichloro-1,1,1-trifluoromethane (HCFC-123), *Climatic Change*, 42, 439-474.
- Hayhoe KAS, **AK Jain**, HM Pitcher, CN MacCracken, MJ Gibbs, DJ Wuebbles, R Harvey, and D. Kruger (1999), Cost implications of multi-greenhouse gas reduction targets for the U.S., *Science*, 286, 905-906.
- Kheshgi HS, **AK Jain**, R Kotamarthi, DJ Wuebbles (1999), Future atmospheric methane concentrations in the context of the stabilization of greenhouse gas concentrations, *J. Geophys. Res.*, 104, 19,183-19,190.
- Kheshgi, H. S., **A.K. Jain**, and D. J. Wuebbles, 1999: The global carbon budget and its uncertainty derived from carbon dioxide and carbon isotopes, *J. Geophys. Res.*, .104, 31,127-31,144.
- Wuebbles, D.J., **A. Jain**, J. Edmond, D. Harvey, K. Hayhoe, 1999: Global change: state of the science, *Environmental Pollution*, 100, 57-86.
- 2000-2004**
- Jain AK**, BP Briegleb, K Minschwaner, DJ Wuebbles (2000), Radiative forcings and global warming potentials of thirty-nine greenhouse gases, *J. Geophys. Res.*, 105, 20773-20790.
- Li Z, Z Tao, V Naik, DA Good, J Hansen, GR Jeong, JS Francisco, **AK Jain**, DJ Wuebbles (2000), Global warming potential assessment for potential CFC replacement compounds: I. CF<sub>3</sub>OCF=CF<sub>2</sub>, *J. Geophys. Res.* 105, 4019-4029.
- Naik V., **AK Jain**, KO Patten, and DJ Wuebbles (2000), Consistent sets of atmospheric lifetimes and radiative forcings on climate for CFC replacements: HCFCs and HFCs, *J. Geophys. Res.*, 105, 6903-6914.
- Jain AK**, Z Li, V Naik, DJ Wuebbles, DA Good, JC Hanson, JS Francisco (2001), Evaluation of lifetime and radiative forcing on climate for 1,2,2,2-Tetrafluorethyl Trifluoromethyl Ether (CF<sub>3</sub>OCHF<sub>2</sub>CF<sub>3</sub>), *J. Geophys. Res.*, 106, 12615-12618.
- Wuebbles DJ, and **AK Jain** (2001), Concerns about climate change and the role of fossil fuel use, *Fuel Processing Technology*, 71, 99-119.
- Hayhoe KAS, HS Kheshgi, **AK Jain** and D Wuebbles (2002), Substitution of natural gas for coal: Climatic effects of utility sector emissions, *Climatic Change*, doi:10.1023/A:1015737505552.
- Hoffert MI, K Caldeira, G Benford, DR Criswell, C Green, H Herzog, **AK Jain**, HS Kheshgi, KS Lackner, JS Lewis, HD Lightfoot, W Manheimer, JC Mankins, G Marland, ME Mauel, L John Perkins, ME Schlesinger, T Volk, TML Wigley (2002), Advanced Technology Paths to Global Climate Stability: Energy for a Greenhouse Planet, *Science*, 298, 981-987.
- Calderia, K, **A. Jain**, M. Hoffert, 2003: Energy implications of uncertainty in climate sensitivity to increased atmospheric CO<sub>2</sub> concentration, *Science*, 299, 2052-2054.
- Hoffert, M.I, K. Caldeira, G. Benford, D. R. Criswell, C. Green, H. Herzog, **A. K. Jain**, H. S. Kheshgi, K. S. Lackner, J. S. Lewis, H. D. Lightfoot, W. Manheimer, J.C. Mankins, G. Marland, M. E. Mauel, L. John Perkins, M.E. Schlesinger, T. Volk, T. M.L. Wigley, 2003: Planning for future energy resources, *Science*, 300, 581-584.
- Kheshgi HS and **AK Jain** (2003), Projecting future climate change: Implications of carbon cycle model intercomparison, *Global Biogeochemical Cycles*, 17(2), 1047, doi:10.1029/2001GB001842.
- Mueller K<sup>G</sup>, L Cao, K Caldeira, and **AK Jain** (2004), Differing methods of accounting ocean carbon sequestration efficiency, *J. Geophys. Res.-Ocean*, 109, C12018, doi:10.1029/2003JC002252.

West TO, G Marland, AW King, WM Post, **AK Jain**, and K Andrasko (2004), Carbon management response curves: estimates of temporal soil carbon dynamics, *Environmental Management*, 33(4), 507-518.

#### 2005-2009

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### **Invited Lectures, Invited Conference Presentations and Other Presentations (2010- Cont.)**

#### Invited Lectures/Presentations

- Land-Use Change and Associated Changes in Biogeochemical and Biophysical Processes in Monsoon Asian Region, *International Symposium on Bioenergy*, Kharagpur, India, January 5-7, 2010.
- Confronting Global Warming, *Centre for Oceans, Rivers, Atmosphere and Land Sciences (CORAL)*, IIT Kharagpur, India, January 5, 2010.
- LCLUC and Associated Changes in Biogeochemical and Biophysical Processes and Fluxes in Asian Monsoon Region, National Remote Sensing Centre (NRSC), *Indian Space Research Organisation (ISRO)*, Balanagar Hyderabad, India, January 8, 2010.
- Impact of Land Use Changes on the Terrestrial CO<sub>2</sub> and N<sub>2</sub>O, *Center for Atmospheric and Oceanic Science*, Indian Institute of Science, Bangalore, India, January 12, 2010.
- Land-Use Change and Associated Changes in Biogeochemical and Biophysical Processes in Monsoon Asian Region (MAR), *NASA 2010 LCLUC Spring Science Team Meeting*, Bethesda, MD, April 20-22.
- Integrated Science Assessment Model, *LBA DATA-Model Intercomparison Project Workshop*, Natal, State: Rio Grande do Norte, Brazil, June 21-22, 2010.
- Integrated Science Assessment Modeling Approach, *Advance Study Program Summer Colloquium on Asia in the 21<sup>st</sup> Century*, NCAR, Boulder, CO, August 1-3, 2010.
- Land Cover and Land Use Change in Integrated Science Assessment Model (ISAM), *First Annual Integrated Assessment Modeling Group meeting*, NCAR, Boulder, CO., August 4-5, 2010.



- Confronting Global Warming, *Indian Space Research Organization (ISRO)*, Dehradun, India, December 7, 2010.
- Estimating Land Use Emissions using the ISAM, *Advancing Land-use Modeling and Analysis for Carbon Cycling Studies Workshop*, Princeton University, Princeton, NJ, May 17-19, 2011.
- The Influence of Man on Climate Change, *31st Annual Electric Utility Chemistry Workshop*, Champaign, IL, June 7-9, 2011.
- Estimates of Land Cover and Land Use Changes using the Integrated Science Assessment Model (ISAM), *Annual Integrated Assessment Modeling Group meeting*, NCAR, Boulder, CO., July 21-22, 2011.
- Investigating the Role of Biogeochemical Processes in the Northern High Latitudes on Global Climate Feedbacks Using an Efficient Scalable Earth System, *Climate and Earth System Modeling PI Meeting hosted by DOE*, Washington, DC, September 19-22, 2011.
- Land cover and land use change and its effects on carbon dynamics in the Monsoon Asian Region, *International Conference on Land Cover Land Use Change in South East Asia*, Hanoi, Vietnam, November 7-10, 2011.
- Exploring the Sensitivity of Terrestrial Ecosystems and Atmospheric Exchange of CO<sub>2</sub> to Global Environmental Factors, *American Geophysical Union (AGU) Fall meeting*, San Francisco, CA, December 5 – 9, 2011.
- Implication of Growing Large-Scale Energy Crops on Water Balance, *Annual Integrated Assessment Modeling Group meeting*, NCAR, Boulder, CO., July 19-20, 2012.
- Land-Use (& Land Cover Change), Biogeochemistry and Climate, *EMF Workshop on Climate Change Impacts and Integrated Assessment*, Snowmass, CO, July 23-27, 2012.
- Estimates of Carbon Emissions from Historical Land Cover and Land-Use Change, *Land Change Emissions Estimates, Data and Modelling*, Exeter University, Exeter, UK, October 17-19, 2012.
- The Influence of Man on Climate Change, *Land Cover and Land Use Change Dynamics and their Impacts in South Asia*, Karunya University, Coimbatore, India, January 7-14, 2013.
- Implication of Growing Large-Scale Energy Crops on Water Balance, *The Cyprus Institute*, Larnaca, Cyprus, April 4, 2013.
- Modeling Carbon Sequestration Under Changing Climate, *Workshop on the Optimal Modelling and Management of Grassland Ecosystem*, Hulunber, Inner Mongolia, China, July 17-25, 2013.
- Reconstructions: consequences of alternative data sets for land-atmosphere interactions, *Joint GLP/iLEAPS/AIMES workshop Interactions among Managed Ecosystems, Climate, and Societies (IMECS)*, Amsterdam, Netherland, September 25-26, 2013.
- Land Use Changes and their Impacts on Biogeochemical and Biophysical Fluxes, *International Conference Global Vegetation Monitoring and Modeling*, Avignon, France, February 3-7, 2014.
- ISAM model calculations for GPP and Latent Energy at Fluxnet Sites, *Model-Experiment Synthesis of Terrestrial Ecosystem Responses to Elevated CO<sub>2</sub> Modelling & Data Workshop*, 24th-28th February 2014, Big Bear, CA, USA.
- Spatial Downscaling Approaches for Allocating Agriculture land Use Change, *Global Land Project Meeting*, Berlin, Germany March 18-22, 2014.

- The Interactions between Biogeophysical and Biogeochemical Processes and their Feedbacks on Permafrost Soil Carbon Stocks, *Environmental Science Division, Argonne National Laboratory, Argonne, IL*, April 3, 2014.
- Implementation of Prognostic LAI in a Land Surface Model to Improve Water, Energy and Carbon Fluxes, *MAIRS Open Science Conference 2014*, April 7-12, 2014, Beijing, China
- Implications of Growing Biofuel Crops on Hydrological Cycle, *MAIRS Open Science Conference 2014*, April 7-12, 2014, Beijing, China.
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- Contributions of Primary and Secondary Forests, and Nitrogen Dynamics to Terrestrial Carbon Emissions, *European Geophysical Union 2014 Meeting*, Vienna, Austria, April 27- May 2, 2014.
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- Impact of growing bioenergy crops on water balance, *NCAR Integrated Assessment Modeling (IAM) Group Annual Meeting*, Boulder, CO, July 21-22, 2014.
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- Land Cover and Land Use Change (LCLUC) Dynamics in South and South East Asia (SSEA), *Future Earth: Science for Society*, Michigan State University, Lansing MI 48910 USA, February 25-27, 2015.
- The implications of growing bioenergy crops on water resources, carbon and nitrogen dynamics in the US, *Department of Marine, Earth, & Atmospheric Sciences, North Carolina State University*, Raleigh, NC 27695, March 23, 2015.
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- The implications of growing bioenergy crops on water resources, carbon and nitrogen dynamics in the US, *ExxonMobil Research and Engineering Company*, Annandale, NJ 08801, May 10-12, 2015.
- The implications of growing bioenergy crops on water resources, carbon and nitrogen dynamics in the US, *Carnegie Institution for Science's Department of Global Ecology, Stanford University*, Stanford, CA 94305, June 19, 2015.
- Impacts of LCLUC on Carbon Cycling in South and South East Asia, *International Workshop on Air Quality in Asia-Impacts of Land Cover/Land Use Changes on Greenhouse Gases/SLCP Emissions and Aerosols*, August 4-7, 2015, Bogor, Indonesia.

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- Implications of Prognostic Leaf Area Index in a Land Surface Model: Evaluation of Water, Energy and Carbon Fluxes in Tropical Asia Using Flux Net Tower Data, *AsiaFlux Workshop2015: Challenges and Significance of Ecosystem Research in Asia to Better Understand Climate Change*, Pune, India, November 22-29, 2015,.
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- The Implications of Growing Bioenergy Crops on Water Resources, Carbon and Nitrogen Dynamics in the United States, *Department of Agricultural and Biological Engineering at UIUC*, April 15, 2016.
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- Increased Influence Of Nitrogen Limitation On Carbon Dioxide Emissions From Future Land Use And Land-use Change, *Asian Oceania Geoscience Society (AOGS) 13<sup>th</sup> Annual Meeting*, Beijing, China, July 31 - Aug 5, 2016.
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- The Implications of Growing Bioenergy Crops on Water Resources, Carbon and Nitrogen Dynamics, *American Geophysical Union (AGU) Fall 2016 Meeting*, San Francisco, CA, Dec. 12-16, 2016.
- Evaluating the Crop Productivity under Variable and Changing Climate: An Integrated Data-Modeling Approach, *NASA Ames*, Moffett Field, CA, February 8, 2017.
- The Implications of Growing Bioenergy Crops on Water Resources, Carbon and Nitrogen Dynamics in the US, *Joint Global Research Institute, Pacific Northwest National laboratory*, College Park, MD, April 3, 2017.
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- Carbon Dioxide as It Relates to Climate Change, *Indian Institute of Science Education and Research*, Pune, India, January 5, 2018.
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- Dynamics and Drivers of Land Cover & Land Use Changes in Bangladesh – Integration of Satellite Data with Socioeconomic Dataset, *International meeting Co-Organized by NASA LCLUC program entitled "Land Cover/Land Use Changes (LC/LUC) and Impacts on Environment in South/Southeast Asia - International Regional Science Meeting*, Philippines, 28-30th May 2018.
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- South Asian Forests and Carbon Sequestration, South/Southeast Asia Research Initiative (SARI) meeting *Sustainable Forestry in South Asia – Current Status, Science and Conservation Priorities*, New Delhi, India, 7-9 November, 2019.
- Modeling the Influence of Land Use and Land Cover Change (LULCC), *E3SM All-Hands Meeting* hosted by DOE, Washington, DC, 18-21 November, 2019.
- Web-Based Tool to Study the Impact of Agricultural and Land-Use Practices on Climate, *Universiti Teknologi Malaysia*, 81310 Skudai, Johor, Malaysia, 25 July, 2019.
- Crop Growth Modeling: ISAM Approach, *Global Gridded Crop Model Intercomparison (GGCMI) – AgMIP*, Montpellier, France, 6-7 February, 2020.
- Global Carbon Fluxes Induced by Management Practices on Agricultural Land, *E3SM All-Hands Meeting* hosted by DOE, Online, 26-29 October 2020.
- GHG emissions budget synthesis for South Asia Region, *RECCAP-2 Virtual All Hands Meeting*, Online, 21-27 October 2020.

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- Khanna, M., **A. K. Jain**, H. Onal, and J. Scheffran, 2010: Application of an Integrated Biogeochemical Crop Growth Model for Predicting Potential U.S. Biofuel Crop Yields, *Energy Bioscience Institute 2009 Research Retreat*, Urbana, IL, June 19-22, 2010.
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- Jain, A., M. Liang, R. Barman, X. Yang, P.S. Roy and A. Roy, 2010: Impact of Land Use Changes & N Deposition & Fertilizer on Carbon & Nitrogen Stock of Plants and Soils in Asia, *5th International Nitrogen Conference 2010*, New Delhi, India. Dec 3-7, 2010.
- Jain, A., M. Liang, R. Barman, X. Yang, P. Meiyappan, 2010: Impacts of Land Use Change, Nitrogen Deposition and Nitrogen Fertilizers on Carbon and Nitrogen Stocks of Plants and Soils, *Fall 2010 American Geophysical Union (AGU) Meeting*, San Francisco, CA, 13-17 December 2010.
- Liang, M., Y. Song, R. Barman, A. Jain)An Integrated Biogeochemical and Biophysical Analysis of Bioenergy Crops, *Fall 2010 American Geophysical Union (AGU) Meeting*, San Francisco, CA, 13-17 December 2010.
- Barman, R., **A. Jain**, M. Liang and A. D. McGuire, 2010: Investigating the interactions between biogeophysical and biogeochemical processes in the northern high latitudes using a land surface model; feedbacks and climatic impacts, *Fall 2010 American Geophysical Union (AGU) Meeting*, San Francisco, CA, 13-17 December 2010.
- Yang, X., W. Post, P. Thornton, A. Jain, 2010: The Distribution of Soil Phosphorus in Terrestrial Ecosystems, *Fall 2010 American Geophysical Union (AGU) Meeting*, San Francisco, CA, 13-17 December 2010.
- Jain, A., P. Meiyappan, R. Nemani, S. Ganguly, D. Skole, W. Chomentowski, B. O'Neill, 2011: LCLUC and its Effects on Carbon and Nitrogen Dynamics in Monsoon Asian Region, *NASA 2011 LCLUC Spring Science Team Meeting*, University of Maryland, College Park, MD, March 28-30, 2011.

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- Song, Y, P. Meiyappan, A. Jain, M. Khanna and H. Huang: 2011: An Integrated Biogeochemical, Biophysical and Economic Analysis of Bioenergy Crops, Ecological Society of America (ESA) annual meeting, Austin, TX, August 7-12, 2011.
- Barman, R, F. Hoffman, Y. Song, P. Meiyappan, A. Jain, R. Jacob, M. Vertenstein (2011): Studying Uncertainties in Climate-Terrestrial Biogeochemical Feedbacks in the Northern High Latitudes using a Flexible Earth System Modeling Framework, *American Geophysical Union (AGU) Fall meeting*, San Francisco, CA, December 5 – 9, 2011.
- Meiyappan, P, R. Barman, A. Jain, G. McIsaac, and P. Lawrence (2011): Impacts of Future Land-Use Change on Nitrogen Leaching and Global Water Quality, *American Geophysical Union (AGU) Fall meeting*, San Francisco, CA, December 5 – 9, 2011.
- Song, Y. R. Barman and A. Jain (2011): Energy Crops and their Implications on Soil Carbon Sequestration, Surface Energy and Water Balance, *American Geophysical Union (AGU) Fall meeting*, San Francisco, CA, December 5 – 9, 2011.
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- El-Masri, B. and A. K. Jain (2012): Modeling the above and below ground carbon and nitrogen stocks in northern high latitude terrestrial ecosystems, *American Geophysical Union (AGU) Fall meeting*, San Francisco, CA, December 3 – 7, 2012.
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- House J, R Houghton, **AK Jain**, et al. (2013): Reconciling global and regional trends in LULUCF fluxes, 9<sup>th</sup> International Carbon Dioxide Conference, Beijing, China, June 3-7, 2013.
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