

Julia K. Steinberger

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Email: julias@alum.mit.edu
Nationality: Swiss and USA
Birth: 1974, Geneva, Switzerland

Research interests

Investigating the distribution, purpose, impacts, and alternatives of resource use in terms of human needs and environmental sustainability.

Employment

- 2007 - present: Senior researcher at the Vienna Institute of Social Ecology. Specific projects: global trends in energy use and living standards; time series data analysis for material flows in the EU-15; EU FP7 SUME project on Sustainable Urban Metabolism; analytic methods applied to biomass, energy and material flows in cross-country and time-series datasets.
- 2006-2007: Postdoctoral researcher at the University of Lausanne, with Professors Suren Erkman and Dominique Bourg, and at the University of Zurich with Professor Claudia Binder. Topics: assessing the effectiveness of Geneva's energy programs towards reaching Kyoto protocol goals, LCA of the international textile chain, applying concepts of the performance economy to energy systems, creating a computer program for sustainability assessments of interacting indicators applied to the Swiss dairy sector.
- 2005: Studying development studies and ecological economics at the Institute for Development Studies of the University of Geneva (now HEID). Reporting on international organizations and news as Geneva correspondent for Free Speech Radio News (USA). Coordinator of the ICT4Peace project, supported by the Swiss government, for the United Nations World Summit for the Information Society.
- 1997-2004: Research assistant in the Ultracold Hydrogen Group of the physics department at MIT. Research on magnetically trapping hydrogen and deuterium, high resolution laser spectroscopy of hydrogen.
- 1997-1999: Research assistant in the astronomy division of the physics department at MIT. Research on X-ray pulsars, discovery of the steady rotation of Anomalous X-ray Pulsars.
- 1996-1997: Research assistant in the Cryogenic Space Neutrino Detection Group at Brown University.
- 1994-1996: Undergraduate research assistant in the Observational Cosmology Group of the physics department at Brown University. Research on the polarization of the Cosmic Microwave Background Radiation. Designed computer-based 3-D visualization tutorials for multivariate calculus in the Mathematics Department.

Languages

English and French (mother tongues), German, Spanish.

Education

PhD in Physics, 2004, Massachusetts Institute of Technology, Cambridge, Massachusetts, USA

Thesis title: Progress towards high precision measurements on ultracold metastable hydrogen and trapping deuterium

ScB in Mathematics and Physics, 1996, Brown University, Providence, Rhode Island, USA

Senior thesis on modeling the detection of polarization of the Cosmic Microwave Background Radiation.

Graduated with Honors in Physics, Brown University Astronomy Prize for Senior Thesis Research.

Maturité Scientifique, 1993, Collège de Saussure, Genève, Suisse

Mention "très bien", awarded de Saussure prize.

Teaching

Institute of Social Ecology, Vienna 2007-2010

Masters seminars: "Energy in human-environment relations", "Analytic methods in social ecology", "Discourses in environmental sociology"

Guest lectures

Energy module of the Industrial Ecology course in the Environmental Masters at the University of Lausanne. (2007-2009)

Energy and sustainability for the "Scientific and institutional challenges of sustainability" course at the University of Geneva (2008-2009)

Sufficiency concepts in rational energy use, University of Geneva. (2009)

Energy component of the Environmental Regulation course in the Environmental Masters at the University of Fribourg. (2007)

Math and physics

Junior high school math and physics, (spring 2005, Geneva), weekly recitations in statistical physics (spring 2003, MIT), conducted monthly science exposure and familiarization classes for Boston children aged 6-12 as a volunteer for TTT Foundation (2000-2004, MIT), weekly recitations in mathematics for engineers (1996-1997, Brown University), teaching assistant for a computer-based multivariate calculus course (fall 1994, Brown University).

Student supervision

PhD dissertation:

Marlyne Sahakian, Understanding consumption patterns in Metro Manila, University of Geneva (ongoing).

Masters thesis:

Dominik Wiedenhofer, spatial analysis of direct and indirect energy use in Australia, Institute of Social Ecology Vienna (ongoing).

Ana Rita de Jesus Carvalho, "Facteurs d'émissions pour les tables Input-Output internationales – cas du dioxyde de soufre)," EPFL 2007.

François Turk, "La compensation de CO₂, une réelle diminution de l'effet de serre?," EPFL, 2007.

Awards, membership in academic societies and professional committees

Elected to the Nominating Committee of the International Society of Industrial Ecology 2010-2012.

Lead Author of the Urbanization knowledge module of the IIASA Global Energy Assessment (2008-2010).

Member of the International Society of Industrial Ecology since 2007.

Member of the International Society of Ecological Economics since 2010.

Award from the Mayor of Cambridge, Massachusetts, recognizing science tutoring (2004).

Computer

Extensive programming experience with Matlab, C, Simapro (Life-Cycle Analysis software), Autocad, LaTeX, Fortran, Audacity on Linux and Windows.

Event organization

4-6 November 2009: 2nd SUME project interface workshop (Sustainable Metabolism for Europe) at the Institute of Social Ecology in Vienna.

November 18 2005: High-level discussion panel at the United Nations World Summit for the Information Society in Tunis on "Information and Communication Technology for Peace"

March 6 2004: Conceived and organized "Depleted Uranium: Toxic Contaminant or Necessary Technology" conference at MIT.

June 6 2002: Organized pre-commencement concert and showing of documentary "Life and Debt" by Stephanie Black at MIT.

2001-2002: Organized "Whose World Economy?" weekly documentary film series at MIT.

Peer-reviewed publications

- Steinberger, J.K., Krausmann, F. and Eisenmenger, N. (2010): Global patterns of material use: a socioeconomic and geophysical analysis. *Ecological Economics* 69(5), pp. 1148-1158.
- Kennedy, C., Steinberger, J.K., Gasson, B., Hansen, Y., Hillman, T., Havranek, M., Pataki, D.E., Phdungsilp, A., Ramaswami, A. and Villalba Mendez, G. (2010): Methodology for inventorying greenhouse gas emissions from global cities. *Energy Policy*, pp. In press.- doi:10.1016/j.enpol.2009.08.050.
- Binder, C.R., Feola, G. and Steinberger, J.K. (2010): Considering the normative, systemic and procedural dimensions in indicator-based sustainability assessments in agriculture. *Environmental Impact Assessment Review* 30, pp. 71-81.
- Weisz, H. and Steinberger, J.K. (2010): Reducing energy and materials flows in cities. *Current Opinion in Environmental Sustainability* -accepted.
- Steinberger, J.K., Friot, D., Jolliet, O. and Erkman, S. (2009): A spatially explicit life cycle inventory of the global textile chain. *International Journal of Life Cycle Assessment* 14(5), pp. 443-455.
- Steinberger, J.K., van Niel, J. and Bourg, D. (2009): Profiting from negawatts: reducing absolute consumption and emissions through a performance-based energy economy. *Energy Policy* 37(1), pp. 361-370.
- Kennedy, C., Steinberger, J.K., Gasson, B., Hansen, Y., Hillman, T., Havranek, M., Pataki, D.E., Phdungsilp, A., Ramaswami, A. and Villalba Mendez, G. (2009): Greenhouse gas emissions from global cities. *Environmental Science and Technology* 43(19), pp. 7297-7302.
- Steinberger, J.K. (2008): Book review of Sustainable Energy: Choosing Among Options by J. W. Tester, E. M. Drake, M. W. Golay, M. J. Driscoll, and W. A. Peters and Energy at the Crossroads: Global Perspectives and Uncertainties by V. Smil. *Journal of Industrial Ecology* 12(2), pp. 248-249.
- Steinberger, J.K. (2008): Book review of Sustainability Indicators - A Scientific Assessment edited by Tomas Hak, Bedrich Moldan and Arther Lyon Dahl., SCOPE Volume 67. *Journal of Industrial Ecology* 12(5/6), pp. 802-804.
- Landhuis, D., Matos, L., Moss, S.C., Steinberger, J.K., Willmann, K.V.L., Greytak, T.J. and Kleppner, D. (2003): Inelastic Collision Rates of Trapped Metastable Hydrogen. *Physical Review A* 67, pp. 022718.
- Kaspi, V.M., Chakrabarty, D. and Steinberger, J.K. (1999): Precision timing of two anomalous X-ray pulsars. *Astrophysical Journal* 525(1), pp. L33-L36.
- Keating, B., Timbie, P., Polnarev, A. and Steinberger, J.K. (1998): Large angular scale polarization of the cosmic microwave background radiation and the feasibility of its detection. *Astrophysical Journal* 495(2), pp. 580-596.

Book chapters, conference proceedings, reports, PhD thesis

- Steinberger, J.K. and Roberts, J.T. (2009): Across a Moving Threshold: energy, carbon and the efficiency of meeting global human development needs, in: Vienna: IFF Social Ecology, Social Ecology Working Paper 114.
- Erb, K.-H., Haberl, H., Krausmann, F., Lauk, C., Plutzer, C., Steinberger, J.K., Müller, C., Bondeau, A., Waha, K., and Pollack, G. (2009): Feeding and fuelling the world sustainably, fairly and humanely, a scoping study. Vienna, Potsdam: Institute of Social Ecology and PIK Potsdam. Report commissioned by Compassion in World Farming and Friends of the Earth UK, 1-102.
- Binder, C., Steinberger, J.K., Schmidt, H., and Schmid, A. (2009): Sustainability Solution Space for the Swiss milk value added chain: Combining LCA data with socio-economic indicators. In: Nemecek, Thomas and Gaillard, Gérard (Eds.): *Proceedings of the 6th International Conference on LCA in the Agri-Food Sector - Towards a sustainable management of the Food chain. November 12-14, 2008, Zurich, Switzerland*. Zürich: Agroscope Reckenholz-Tänikon Research Station ART, pp. 219-227.
- Steinberger, J.K., van Niel, J. and Bourg, D. (2008): Vers une économie fondée sur la performance énergétique. *La Revue Durable* (31), pp. 46-50.
- Binder, C., Steinberger, J.K., Brundiers, K., Schmidt, H., and Schmid, A. (2008): Nachhaltigkeit in der Schweizerischen Milchwertschöpfungskette (Schlussbericht). Zurich: Social and Industrial Ecology, University of Zurich, 1-34
- Steinberger, J.K., Friot, D., Jolliet, O., and Erkman, S. (2007): Location-specific global product LCI : a textile case study. In: *Proceedings of Life Cycle Management 2007, Zürich, August 27-29*. Zürich.
- Castoldi, N., Bechini, L., Steinberger, J.K., and Binder, C. (2007): Sustainability Solution Space using agro-

ecological indicators at field level, in: Presentation at "Farming Systems Design 2007" in Catania, Italy, September 10-12.

Steinberger, J.K., Lassueur, T., and Seal, T. (2006): Evaluation des programmes d'action du Plan Directeur Cantonal de l'Energie 2001-2005. Report to the Canton of Geneva, IPTEH, University of Lausanne

Curion, P. and Steinberger, J.K. (2006): The Role of ICT in Crisis Management. In: *Faster and More United? - the debate about Europe's crisis response capacity*. European Commission.

Stauffacher, D., Curion, P., Drake, W., and Steinberger, J.K. (2005): *Information and Communication Technology for Peace: the role of ICT in preventing, responding to and recovering from conflict*. New York: United Nations ICT Task Force.

Steinberger, J.K. (2004): Progress towards high precision measurements on ultracold metastable hydrogen and trapping deuterium, Massachusetts Institute of Technology, Physics Department.

Conferences & Workshops

- June 2009: Presentation "Global patterns of material use: the impact of economic development, population and technology on cross country differences of material consumption." with Fridolin Krausmann and Nina Eisenmenger. International Society of Industrial Ecology, Lisbon, Portugal, 21-24 June 2009.
- February 2009: Presentation "Measuring low carbon cities" (with Helga Weisz) at the workshop "Towards low carbon cities: understanding and analyzing urban energy and carbon" in Nagoya, Japan
- September 2008: Presentations at Conaccount, Charles University, Prague "The Evolving Energy requirements of human society: global trends in the human development-Energy relationship, 1975-2005" (with J. Timmons Roberts).
- August 2008: Posters "The Evolving Energy requirements of human society: global trends in the human development-Energy relationship, 1975-2005" (with J. Timmons Roberts) and "The evolution of material and energy flows of the EU-15, 1970-2004" (with Helga Weisz, Fridolin Krausmann and Nina Eisenmenger), Gordon Research Conference on Industrial Ecology, Colby-Sawyer College, New Hampshire
- June 2008: Presentation: "The changing relation of energy consumption and human development: a global study 1975-2005" at Advances in Energy Studies 2008, TU Graz
- October 2007: Presentation: "Discussing system boundaries of urban metabolism by considering direct and indirect resource use" jointly with Helga Weisz, Workshop Analysing Stocks and Flows of the Urban Built Environment, Trondheim, Norway
- August 2007: Presentation: "LCA for globalized trade: data requirements and challenges from a textile case study", LCM 2007, Zürich
- June 2007 : Accepted talk: "Kyoto targets for growing urban regions: using the case study of Geneva, Switzerland to understand the potential and limits of regional approaches to climate and energy policy implementation", ISIE 2007, Toronto
- April 2007: Invited speaker for round-table "Quel avenir énergétique pour les pays du Sud?", EPFL, organized by Ingénieurs du Monde.
- August 2006: Poster "Assessment of Geneva's Energy Action Programs", Gordon Research Conference, Oxford