



# CHINA PROJECT NEWSLETTER

We are pleased to roll out the first China Project newsletter! We plan to publish a newsletter at the end of every semester, recounting our recent activities and latest research developments, as well as previewing some of our upcoming activities. The newsletter will be available in both Chinese and English and in various printed and electronic forms.

Our website has also been completely re-designed, with a new Project logo! The new website is more user-friendly and searchable, and is constantly updated to include the latest China Project publications and research endeavors,

upcoming events, recent news, a list of current contributors, and a library of videos and podcasts. If you haven't already done so, you can subscribe to our electronic mailing list on the website to receive event announcements, newsletters, and other updates.



NEWS	EVENTS	PUBLICATIONS
<p><b>Nobel Prize</b> <b>Maria Goeppert</b> <b>awards</b> <b>physics</b> <b>and</b> <b>chemistry</b> <b>in</b> <b>Beijing</b> <b>and</b> <b>Harvard</b> <b>City</b> Friday, February 10, 2017</p>	<p><b>China Project</b> <b>Alumni</b> <b>Gathering</b> <b>in</b> <b>Beijing</b> <b>to</b> <b>celebrate</b> <b>the</b> <b>50th</b> <b>anniversary</b> <b>of</b> <b>the</b> <b>China Project</b> Friday, August 11, 2017</p>	<p><b>Global</b> <b>potential</b> <b>for</b> <b>wind</b> <b>generated</b> <b>electricity</b> Assessment of the economic potential of China's onshore wind electricity</p>
<p><b>Dr. Ed</b> <b>in</b> <b>Fortuna</b> <b>by</b> <b>the</b> <b>2017</b> <b>China Project</b> <b>Challenge</b> <b>Summer</b> <b>Course</b> <b>in</b> <b>Beijing</b> Friday, January 10, 2017</p>	<p><b>China's</b> <b>Environmental</b> <b>Challenge</b> <b>Summer</b> <b>Course</b> <b>in</b> <b>Beijing</b> Sat. Jul. Aug 5 - Aug 19, 2016pm - 2:00pm</p>	<p><b>Traffic</b> <b>congestion</b>, <b>air</b> <b>pollution</b> <b>and</b> <b>health</b> <b>impacts</b> <b>from</b> <b>heavy</b> <b>vehicles</b> <b>in</b> <b>Beijing</b></p>
<p><b>McElroy</b> <b>on</b> <b>impact</b> <b>of</b> <b>China</b> <b>Administration</b> <b>on</b> <b>Climate</b> <b>Change</b> Wednesday, November 16, 2016</p>		<p><b>Wind</b> <b>and</b> <b>solar</b> <b>power</b> <b>in</b> <b>the</b> <b>United</b> <b>States</b> <b>China</b> <b>and</b> <b>Impacts</b></p>

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Mario Molina,  
Nobel Prize Laureate



Poster Image from  
*Behemoth*

## Public Lectures and Seminars

The China Project hosted two major University-wide events this academic year: a public lecture with Chemistry Nobel Laureate Mario Molina, and a screening of the Chinese environmental film *Behemoth* and discussion with its director, Zhao Liang.

Molina's talk, delivered to a capacity crowd in February 2017, called for more fundamental research and interdisciplinary collaboration on air pollution in the world's megacities. Focusing on Mexico City and Beijing, he argued that cities can learn from each other and that fundamental scientific research remains essential to creative air quality solutions. The Department of Environmental Health of the Chan School of Public Health and the Harvard Global Institute

co-sponsored this event.

In April, sponsored by the Harvard Global Institute, the China Project partnered with The DocYard, Crows & Sparrows, and the Environment in Asia Series of the Fairbank Center to welcome Zhao Liang to screen and discuss his film, *Behemoth*, in a packed Brattle Theater. The film begins with a mining explosion in Mongolia and ends in a ghost city west of Beijing, while detailing, in one breathtaking sequence after another, the human and environmental costs of modern industrial development. Zhao then joined the audience by live video link from Beijing for a Q&A on the themes and cinematic techniques of his stunning and unique film.

The China Project also continued its

well-attended run of seminars this past academic year. It hosted fifteen multidisciplinary research seminars, most co-sponsored by other programs and centers from across Harvard schools. Focused on China, topics were as diverse as indoor and outdoor air pollution measurement, effects of climate change on cities and air quality, carbon trading, environmental public interest litigation, the health effects of air pollution, and energy efficiency of buildings. Speakers included Ding Yihui from China's National Climate Center, Barbara Finamore of the Natural Resources Defense Council, Gary Adamkiewicz from the Harvard Chan School of Public Health, and Zhao Yu and Wang Haikun from Nanjing University, among others.

### Video: *Comparing Air Pollution and Its Health Effects in Beijing and Mexico City*

The Harvard China Project recently released a short video in which several of our experts and partners from across Harvard, Tsinghua, and Mexico share their insights and research on reducing urban air pollution and environmental health risks in Beijing and Mexico City. This video was produced alongside the public lecture that Nobel Laureate Mario Molina delivered to a capacity crowd on February 8. To watch the video, visit: <https://vimeo.com/208870423>



## Summer Activities

Thirty Harvard undergraduates will participate in a two-week summer course on China's environmental challenges in Beijing this August, sponsored by the Harvard Global Institute's award to the China Project. The program is hosted by the Tsinghua University School of Environment, and developed in partnership with the China Project, including lectures and site visits led by Profs. Mike

McElroy and Dale Jorgenson.

In addition, we have begun planning a number of other events in Beijing in early August, including: a Harvard Global Institute-sponsored panel on the intersection of climate, energy, environment, and health; a public lecture at Tsinghua; a gathering for China Project alumni; and more. Stay tuned for updates!



## China Project Research Updates

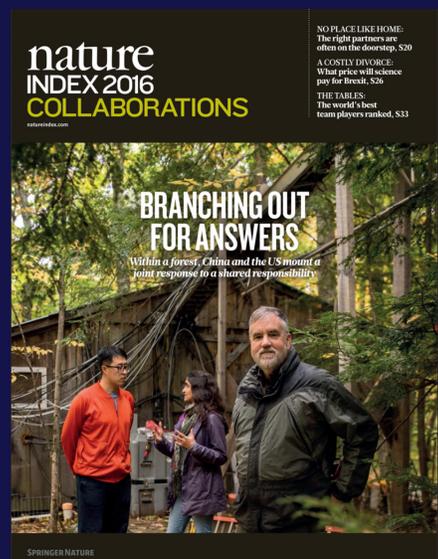
◆ The China Project is featured in the cover article of *Nature Index 2016 Collaborations*, on international research collaborations. Quoting Mike McElroy and Bill Munger, the article highlights Project-supported research on the carbon cycle, based on observations at our atmospheric station near Beijing as well as other sites in U.S. and Chinese forests.

There is also an accompanying short video that includes interviews with senior research fellow Bill Munger and students Liu Jialin and Archana Dayalu on-site at the beautiful Harvard Forest.

To watch the full video, visit: [www.natureindex.com/supplements/nature-index-2016-collaborations](http://www.natureindex.com/supplements/nature-index-2016-collaborations)

◆ The China Project's atmospheric station at Miyun, operated jointly with Tsinghua University, has been reconstructed with upgraded systems. It is measuring five trace gases (CO, CO<sub>2</sub>, O<sub>3</sub>, SO<sub>2</sub>, NO/NO<sub>y</sub>), with a new analyzer of methane (CH<sub>4</sub>) to be added soon. With Tsinghua, we are now planning deployment of a second station, south of Beijing.

◆ China Project electrical engineering researchers have constructed a high-resolution optimization model, based on hourly simulation of power and heating systems, to assess the integration of wind power in the energy systems of the wind-rich, northern regions of China. Current results show the promise of reduced curtailment of wind power through better coordination of inter-provincial transmission scheduling, deployment of electrified space heating technologies, and other innovative strategies.



◆ Capitalizing on the yearlong visit of Prof. Cao Jing and students from Tsinghua, the China Project economics team has developed a new model of household demand, including of energy, to incorporate into its larger modeling framework. Using data from urban and rural surveys, they are showing how expenditure patterns change with rising incomes, evolving family structures, and prices. The new results will also broaden interdisciplinary assessments of the effects of policies on the economy and energy use, including at the household level, and ultimately on atmospheric environment.

◆ The China Project's household survey on travel behavior, land use, and environmental health risk in the city of Chengdu, conducted with Peking University, is completed. The dataset has been joined to that of a nearly identical China Project survey in 2005, yielding a time series covering changes in Chengdu over a decade. Several teams are now analyzing the data, including researchers at the Harvard's School of Public Health, Graduate School of Design, and School of Engineering and Applied Sciences, Tufts University, and Nanjing University.



## RECENT PUBLICATIONS

Michael B. McElroy and Xinyu Chen. 2017. "Wind and solar power in the United States: Status and prospects." *Chinese Society for Electrical Engineering Journal of Power and Energy Systems*, 1, 3.

Changyi Liu, Yang Wang, and Rong Zhu. 2017. "Assessment of the economic potential of China's onshore wind electricity." *Resources, Conservation and Recycling*, 121: 33-39.

Rong Xie, Clive E. Sabel, Xi Lu, Weimo Zhu, Haidong Kan, Chris P. Nielsen, and Haikun Wang. 2016. "Long-term trend and spatial pattern of PM<sub>2.5</sub>-induced premature mortality in China." *Environment International*, 97: 180-186.

Ning Zhang, Xi Lu, Chris P. Nielsen, Michael B. McElroy, Xinyu Chen, Yu Deng, and Chongqing Kang. 2016. "Reducing curtailment of wind electricity in China by employing electric boilers for heat and pumped hydro for energy storage." *Applied Energy*, 184: 987-994.

Meiyu Guo, Xi Lu, Chris P. Nielsen, Michael B. McElroy, Wenrui Shi, Yuntian Chen, and Xuan Yu. 2016. "Prospects for shale gas production in China: Implications for water demand." *Renewable and Sustainable Energy Reviews*, December, 66: 742-750.

Jing Cao, Mun S. Ho, and Huifang Liang. 2016. "Household energy demand in urban China: Accounting for regional prices and rapid economic change." *The Energy Journal*, 37.

Michael B. McElroy. 2016. *Energy and Climate: Vision for the Future*. 1st ed. New York: Oxford University Press.

Yinmin Xia, Yu Zhao, and Chris P. Nielsen. 2016. "Benefits of China's efforts in gaseous pollutant control indicated by bottom-up emissions and satellite observations 2000-2014." *Atmospheric Environment*, July, 136: 43-53.

Xi Lu, Michael B. McElroy, Wei Peng, Shiyang Liu, Chris P. Nielsen, and Haikun Wang. 2016. "Challenges faced by China compared with the US in developing wind power." *Nature Energy*, 6, 1.

Qing Yang, Yingquan Chen, Haiping Yang, and Hanping Chen. 2016. "Greenhouse gas emissions of a biomass-based pyrolysis plant in China." *Renewable and Sustainable Energy Reviews*, January, 53: 1580-1590.