

# Conference on the Chinese National Innovation and Techno-Industrial Eco-Systems

JOINTLY ORGANIZED BY THE UNIVERSITY OF CALIFORNIA INSTITUTE ON GLOBAL CONFLICT AND COOPERATION (IGCC) AND THE MERCATOR INSTITUTE FOR CHINA STUDIES (MERICS)

BERLIN, SEPTEMBER 5-6, 2023

China has embarked on a program of unprecedented ambition to manage the entire “innovation chain.” Seeking to steer outcomes, the Chinese government is increasingly intervening, organizing, and coordinating activities that stretch from basic research to final applications in industry and defense. The Chinese approach implies interventions in successive specific links of the innovation chain, links that have in the past generally been analyzed separately in terms of either the national innovation system or the techno-industrial system. This conference seeks to understand the organization, functions, and increasingly interdependent operations of both the national innovation system and the techno-industrial eco-system. Key questions to be addressed include:

- How are the key institutional features and governance regimes of the Chinese national innovation and techno-industrial eco-systems changing? How have they evolved since the early 2010s when Xi Jinping came to power?
- In what ways are the Chinese innovation and techno-industrial eco-systems becoming increasingly connected and engaged with each other?
- What are the concrete implications of the “New Whole-of-Nation System” and the “Modern Industrial System” currently being advocated?
- How integrated are the Chinese innovation and techno-industrial eco-systems with the outside world? What are the prospects for these linkages in an era of great power competition?
- How are the civilian, dual-use, and defense components of the innovation and techno-industrial systems related to each other? Where in the spectrum between military-civil separation and integration does the Chinese innovation and techno-industrial systems fall?
- What is the role and balance between the state and market forces? How successfully can China graft increased government direction onto the vibrant, market-based economy that had developed over the previous thirty years?

Location: MERICS Lounge (Klosterstr. 64 · 10179 Berlin)

TUESDAY, 5 SEPTEMBER 2023	
07:30	<b>Breakfast available in conference room</b>
08:00	<b>Opening Remarks</b> Mikko Huotari (MERICS) and Tai Ming Cheung (IGCC)
08:15	<b>Panel 1.1: Missions</b> <b>Chair: Sylvia Schwaag Serger</b> <b>Barry Naughton</b> (IGCC): What is New? China's Approach to Large-Scale, Mission-Driven Research and Development Under Market Conditions <b>Jeroen Groenewegen-Lau</b> (MERICS): How the whole-of-nation approach will address short boards in the innovation chain The Evolving Chinese national innovation system: an institutional approach <b>Discussant: Anna Lisa Ahlers</b>
10:15	<b>Coffee break</b>
10:45	<b>Panel 1.2: Leaders, Institutions and Processes Behind National S&amp;T Policy</b> <b>Chair: Barry Naughton</b> <b>Tai Ming Cheung</b> (IGCC): Fortress China: The Techno-Security Turn of the Chinese National Innovation System <b>Bert Hofman</b> (National University of Singapore): Changes in China's National Innovation System: International Competition and Political Change <b>Anna Lisa Ahlers</b> (Max Planck Society): The role of the Party as a reconfigured actor and driver in research and innovation campaigns and institutions <b>Discussant: Sylvia Schwaag Serger</b>
12:30	<b>Lunch</b>
13:30	<b>Panel 1.3: Concentrating Resources</b> <b>Chair: Max Zenglein</b> <b>Alexander Brown, Gregor Sebastian and François Chimits</b> (MERICS): The accelerator state <b>Camille Boullenois</b> (Rhodium Group): Paying for Research and Development <b>Discussant: Barry Naughton</b>
15:00	<b>End of day program</b>
<b>TUESDAY, 5 SEPTEMBER 2023 (KEYNOTE SPEECH, PUBLIC SESSION):</b>	
<b>GLOBAL INNOVATION COMPETITION AND COLLABORATION IN A SHIFTING GEOPOLITICAL CONTEXT</b>	
16:30	<b>Registration for the public</b>
17:00	<b>Welcome</b> Mikko Huotari, Executive Director, MERICS  <b>Introduction of conference theme and findings</b> Barry Naughton, So Kwanlok Chair of Chinese International Affairs, IGCC
17:30	<b>Panel: Chinese engagements across Europe's Triple Helix</b> <b>Signe Ratso</b> , Deputy Director General for Innovation and Research, European Commission <b>Sylvia Schwaag-Serger</b> , Professor, Lund University <b>Philipp Meyer</b> , Managing Director, JFY International, Trumpf <b>Moderator: Bernhard Bartsch, Director External Relations, MERICS</b>
18:30	<b>Break</b>

19:00	<b>Keynote and panel discussion (live stream)</b> <b>Greeting</b> Mikko Huotari, Executive Director, MERICS <b>Keynote speech</b> Bettina Stark-Watzinger, German Federal Minister of Education and Research
19:20	<b>Panel discussion and Q&amp;A</b> <b>Bettina Stark-Watzinger</b> , German Federal Minister of Education and Research <b>Jakob Edler</b> , Executive Director, Fraunhofer ISI <b>Tai Ming Cheung</b> , Director, IGCC <b>Moderator: Mikko Huotari, Executive Director, MERICS</b>
20:00	<b>Reception</b>
21:00	<b>End</b>

### WEDNESDAY, 6 SEPTEMBER 2023

07:45	<b>Breakfast available in conference room</b>
08:30	<b>Panel 2.1: Sectoral Perspectives</b> <b>Chair: Jeroen Groenewegen-Lau</b> <b>Cong Cao</b> (University of Nottingham): Innovation in China: Domestic Efforts and Global Integration <b>Rebecca Arcesati</b> (MERICS): Chinese AI research and industry ecosystems in times of geopolitical competition and deglobalization <b>Keun Lee</b> (Seoul National University): Changing GVC in semi-conductors and the Position of China <b>Discussant: Markus Taube</b>
10:30	<b>Coffee break</b>
11:00	<b>Panel 2.2: The Growing Role of For-Profit R&amp;D in China's Innovation Ecology</b> <b>Chair: Camille Boullenois</b> <b>Markus Taube</b> (University of Duisburg-Essen): AI-Development in Tianjin, PR China <b>Marcus Conlé</b> (Deutsches Elektronen-Synchrotron DESY): New R&D Institutes and knowledge transfer <b>Discussant: Cong Cao</b>
12:30	<b>Lunch</b>
13:30	<b>Panel 2.3: Universities and Public Research Institutes Adjusting to New Incentives</b> <b>Chair: Tai Ming Cheung</b> <b>Jimmy Goodrich</b> (Semiconductor Industry Association): High Performance Computing <b>Emily Weinstein</b> (Center for Security and Emerging Technology): An Update on China's State Key Laboratory System <b>Michael Laha</b> (Sinolytics): The Revamping of the Chinese Industrial Research and Development System <b>Discussant: Liu Xielin</b>
15:30	<b>Coffee break</b>
16:00	<b>Panel 2.4: Translating national plans to sectors and provinces</b> <b>Chair: Anna Lisa Ahlers</b> <b>Antonia Hmaidid</b> (MERICS): China's strategic priorities as indicated by research funding and policy documents Mapping the Provincial Science and Technology Innovation System <b>Discussant: Jeroen Groenewegen-Lau</b>
17:30	<b>End</b>

## BIOGRAPHIES

**Anna L. Ahlers** is the founder and head of the Lise Meitner Research Group China in the Global System of Science at the MPIWG which explores the many facets of China's rapid and extensive ascent in the global system of science. In her current research projects, she focuses on questions of authoritarianism as an environmental factor for science, and, more specifically, on the interactions of scientists and scholars with the government in policy-making in the People's Republic of China (PRC). After studying sinology and political science at the University of Tübingen, Peking University, and Renmin University (PRC), Anna Ahlers completed her PhD in China Studies at the University of Tübingen. Before joining the MPIWG in January 2020, she was a tenured Associate Professor in Modern Chinese Society and Politics at the University of Oslo, Norway. She has also worked at the University of Bonn (FIW), the Mercator Institute for China Studies (MERICS), Academia Sinica (RoChina), and the University of Chicago where she was a Wigeland Visiting Professor in the academic year 2018/19. Between 2017 and 2022 she was a member of the Junge Akademie (BBAW und Leopoldina) and in 2020/21 a fellow at the Wissenschaftskolleg zu Berlin (IAS).

**Rebecca Arcesati** is lead analyst at MERICS. Her research focuses on China's technology and digital policy as well as Europe-China innovation relations. She covers the global footprint of Chinese tech firms, digital infrastructure and surveillance tools, governance of data and artificial intelligence, technology transfer and research collaboration. Prior to joining MERICS, Rebecca gained experience helping Italian tech startups scale in China and as a research assistant in the UN Women China office. She holds an LL.M. in China Studies (Politics and International Relations) from Peking University, where she was a Yenching Scholar. Rebecca received an MA degree in International Studies from the University of Turin and a BA in Language

Mediation and Cross-Cultural Communication from the University of Milan. She has studied and worked in Beijing, Shanghai and Dalian.

**Camille Boulenois** is a Senior Research Analyst with Rhodium Group's China Projects team, where she works on the analysis of China's economic system, industrial policy, and market reform. Before joining Rhodium Group, Camille headed the Brussels office for Sinolytics, advising clients on market governance and data strategies, as well as the regulatory challenges arising from the Corporate Social Credit System. Previously, she worked as an analyst at China Policy and contributed to the EIU, Oxford Analytica, and the ECFR. Camille holds a PhD in international, political, and strategic studies from the Australian National University, where she wrote her dissertation on social mobility and entrepreneurship in the Chinese countryside.

**Alexander Brown** is an analyst at MERICS. His research focuses on industrial policy and foreign economic policy. His work has covered the key policies and actors behind China's emerging green hydrogen sector, China's evolving approach to managing globalization and the Little Giants program. Before joining MERICS, he was an Associate Consultant and Project Consultant at APCO Worldwide in Frankfurt am Main and Beijing. Alexander holds a Master's degree in international political economy from Peking University, and a Bachelor in politics and international relations from the University of Melbourne.

**Cong Cao** is professor of innovation studies in the Department of International Business and Management at the University of Nottingham. Educated in both China and the U.S. and in both the natural and social sciences, Professor Cao has worked at the University of Oregon, the National University of Singapore, the State University of New York, and the University of Nottingham

before joining the University of Nottingham Ningbo China in 2015. As one of the prolific scholars in the social studies of science, technology, and innovation in China, Professor Cao has published extensively in scientific elite; human resources in science and technology; innovation and entrepreneurship in nanotechnology and biotechnology; and the reform of science and technology system. He is the author of *China's Scientific Elite* (RoutledgeCurzon, 2004 and 2012) and *GMO China: How Global Debates Transformed China's Agricultural Biotechnology Policies* (Columbia University Press, 2018). He also is a co-author of *China's Emerging Technological Edge: Assessing the Role of High-End Talent* (with Denis Fred Simon, Cambridge University Press, 2009) and *Innovation in China: Challenging the Global Science and Technology System* (with Richard Appelbaum, Xueying Han, Rachel Parker, and Denis Fred Simon, Polity, 2018). His papers have appeared in international leading journals of science, technology, and innovation and edited volumes. Professor Cao's research has been supported by the U.S. National Science Foundation (NSF), European Union, the National Natural Science Foundation of China (NSFC), among others.

**Tai Ming Cheung** is director of the University of California Institute on Global Conflict and Cooperation and a professor at the School of Global Policy and Strategy at UC San Diego, where he teaches courses on the international relations and national security of China and Chinese security and technology policy. Among the areas of his research focus include China's efforts to become a world-class science and technology power, and the relationship between geoeconomics, innovation, and national security. Dr. Cheung is a long-time analyst of Chinese and East Asian defense and national security affairs, especially defense economic, industrial and science, and technological issues. He is the author of *Innovate to Dominate: The Rise of the Chinese Techno-Security State* (Cornell University Press, 2022), co-editor of *The*

*Gathering Pacific Storm: Emerging US-China Strategic Competition in Defense Technological and Industrial Development* (Cambria Press, 2018), editor of *Forging China's Military Might: A New Framework for Assessing Innovation* (Johns Hopkins University Press, 2014), and author of *Fortifying China: The Struggle to Build a Modern Defense Economy* (Cornell University Press, 2009). He was based in Hong Kong, China, and Japan from the mid-1980s to 2002 covering political, economic, and strategic developments in Greater China and East Asia, first as a journalist for the Far Eastern Economic Review from 1988–1993 and subsequently as a political and business risk consultant for a number of companies, including PricewaterhouseCoopers. Dr. Cheung has a Ph.D. in War Studies from King's College, London.

**François Chimits** research focuses on the economic development of China, paying special attention to financial system, foreign trade and the related level playing field challenges for its trading partners. Before joining MERICS, he worked as a macro-finance analyst at the French Embassy in Beijing. After that he was an economist and deputy head of the trade policy department at the French Ministry of Economy and Finance. He is also in charge of a course on Chinese economy at Sciences Po Paris, and is also affiliated with the research center on international economics CEPII in Paris. François received a Bachelor's degree in International Economics and Development and a Master's degree in International Economic Diagnosis and Development from Paris Dauphine University.

**Marcus Conlé** is a research fellow at Deutsches Elektronen-Synchrotron DESY. He is the coordinator of the project WIKOOP-INFRA that develops recommendations for handling cooperation with China at large research infrastructures. He is also an associate at the German Institute for Global and Area Studies (GIGA), where he co-authors the Asia Pacific Research Area (APRA) Performance Monitoring reports

commissioned by the BMBF. Marcus has done extensive research on China's regional and sectoral innovation systems in Bremen and Duisburg. He studied Area Studies/China in Cologne and Dalian and completed his doctorate at the Mercator School of Management, University of Duisburg-Essen.

**Jimmy Goodrich** is vice president of the Semiconductors Industry Association (SIA). He joined SIA in 2015 and is vice president for global policy. In this role, Jimmy leads SIA's global policy team and directs SIA's international competitiveness, trade, export control, supply chain, global market research, and China policy agenda. Jimmy has a diverse background in international technology trade, supply chain, and security issues spanning a wide range of geographies. Jimmy is also a non resident fellow at the UC Institute on Global Conflict and Cooperation. Previously he was director of China policy at the Information Technology Industry Council (ITI) in Washington D.C. Before moving to Washington D.C. in 2012, Jimmy spent a total of seven years working in the tech sector in China, including for Cisco Systems, APCO Worldwide, and USITO. Jimmy has a bachelor's degree in comparative politics and East Asian studies from Ohio University. He is professionally fluent in Mandarin and serves on the Executive Committee for the Beijing-based United States Information Technology Office (USITO), representing SIA in his capacity and on the Board of Directors of the American Mandarin Society, which promotes Mandarin-language study for young Americans.

**Jeroen Groenewegen-Lau** is head of the program of "Science, Technology and Innovation" at the Mercator Institute for China Studies (MERICS). His research interests revolve around the Chinese research and innovation environment, including talent, research funding, patents, technology transfer, innovation zones, and the involvement of European knowledge institutions and companies. Prior to MERICS, he worked at China Policy, a Beijing-based

research and advisory company. He set up the section on education, science, and innovation at China Policy in 2017, and led it until December 2020. Jeroen spent over ten years in China. He holds a master's degree in languages and cultures of China from Leiden University and wrote about Chinese popular music in his Ph.D. dissertation (cum laude).

**Antonia Hmaid** works on China's pursuit of tech self-reliance (especially in areas like semiconductors and operating systems), its internet infrastructure, and disinformation and hacking campaigns. Hmaid also develops modelling and big data analysis tools. She gained experience as a project manager at the Bertelsmann Stiftung, worked at the German Corporation for International Cooperation (GIZ), as a journalist in Asia and at the German Institute for International and Security Affairs (SWP). Antonia holds a bachelor's degree in East Asian Politics and Economics from Ruhr University Bochum and Renmin University of China, and a master's degree in International Relations from the Graduate Institutes of International and Development Studies (IHED) in Geneva and New Delhi.

**Bert Hofman** is a Senior Associate Fellow at MERICS. He is the director of the East Asian Institute at the National University of Singapore (NUS) and Professor of Practice at the Lee Kuan Yew School. Before joining NUS, he worked with the World Bank for 27 years. Bert was the World Bank Country Director for China (2014-2019), the country economist from (2004-2008), and the Chief Economist for the World Bank in the East Asia and Pacific region from (2011-2014). He also worked on Indonesia, the Philippines, Korea and Mongolia. Before coming to the World Bank, Bert worked at the Kiel Institute of World Economics, the OECD and NMB Bank (now ING). Bert has extensive experience in advising governments in the East Asia and Pacific region on a wide range of development issues. His research focusses on fiscal policy, debt issues, and China's and Indonesia's recent economic history.

**Mikko Huotari** is the Executive Director of MERICS. His research focuses on China's political and economic development, foreign policy, China-Europe relations, as well as global (economic) governance and competition. He has published on China's rise as a financial power, trade and investment relations with Europe as well as on geopolitical shifts related to China's emergence as a global security actor. Mikko studied in Freiburg, Nanjing and Shanghai. He holds a PhD from Freiburg University and was a guest scholar at the University of California in San Diego in 2017/2018. In 2019, Mikko was appointed as one of 15 German representatives to the German-Chinese Dialogue Forum.

**Michael Laha** is a researcher and consultant based in Berlin. He is currently a consultant at Sinolytics, a European research-based consultancy entirely focused on China and operating at the nexus of policy and business. He is member of the 2021-22 cohort of the Alexander von Humboldt Foundation German Chancellor Fellowship and based at the Mercator Institute for China Studies (MERICS). He conducts research on innovation policy, the role of China in the transatlantic relationship, and China's governance model. Before joining the MERICS team, Laha worked at the Asia Society Center on U.S.-China Relations where he most recently was a Senior Program Officer and where he also served as the ChinaFile Books Editor. He holds a M.A. in East Asian Languages and Cultures from Columbia University and B.S. in Chemistry from Tufts University. He is fluent in German and proficient in Chinese.

**Keun Lee** is Distinguished Professor of Seoul National University (economics), and Head of the Center for Comparative Economic Studies. He is a Fellow of the CIFAR (Canada), and founding director of the Center for Economic Catch-up (now chairmen of the board). He is the winner of the 2014 Schumpeter Prize for his monograph on *Schumpeterian Analysis of Economic Catch-up* (2013 Cambridge Univ. Press). He is also an editor of *Research Policy*.

In 2021, He served as the Vice-chairman of the National Economic Advisory Council for the chair and President of Korea. He is also a regular writer for Project Syndicate. He served as the President of the International Schumpeter Society (2016-18), a member of the Committee for Development Policy of UN (2013-18), a GFC member of the World Economic Forum (2016-19). He obtained Ph.D. in economics from the University of California, Berkeley. His total citations received is about 12,600 with H-index of 52 and I-10 index of 140 (Google Scholar).

**Xielin Liu** is a professor in the School of Economics and Management and director of the Research Center for Innovation and Entrepreneurship at the University of Chinese Academy of Sciences in Beijing. His research areas mainly cover innovation management and policy, innovation ecosystems, regional and national innovation systems. He has published a lot of papers in *Research Policy*, *Technovation*, *Journal of Management Studies* and *International Journal of Technology Management, Science and Public Policy*. He served as editor for *Research Policy* and other journals. He has published many books in English: *Regional Innovation Index of China: 2017* (2018, Springer), *Environmental Innovation in China* (WIT, 2012) and *Innovation, Technology Policy and Regional Development* with Tim Turpin (Edward Elgar, 2003).

**Barry Naughton** co-leads IGCC research Chinese science, technology, innovation, and industrial policy. He is the Sokwanlok Chair of Chinese International Affairs at the School of Global Policy and Strategy at UC San Diego, and one of the world's most highly respected economists working on China. He is an authority on the Chinese economy with an emphasis on issues relating to industry, trade, finance, and China's transition to a market economy. Recent research focuses on regional economic growth in China and its relationship to foreign trade and investment. He has addressed economic reform in Chinese cities, trade and trade disputes

between China and the United States, and economic interactions among China, Taiwan, and Hong Kong. Naughton has written the authoritative textbook "The Chinese Economy: Transitions and Growth," which has now been translated into Chinese. His groundbreaking book *Growing Out of the Plan: Chinese Economic Reform, 1978–1993* received the Ohira Memorial Prize, and he most recently translated, edited, and annotated a collection of articles by the well-known Chinese economist Wu Jinglian. Naughton writes a quarterly analysis of the Chinese economy for China Leadership Monitor.

**Gregor Sebastian** is an Analyst at MERICS. His research focuses on China's industrial policy and Chinese foreign direct investment and partnership activities in Europe. He holds an MSc in Economic History from the London School of Economics and Political Science (LSE) and studied Mandarin Chinese in Chengdu. Prior to joining MERICS, he interned at Deutsche Bahn's China Tech Team and at Sinolytics – a China-focused consultancy.

**Sylvia Schwaag Serger** is a professor at Lund University in Sweden. Sylvia has spent 20 years designing, implementing and studying innovation policy in Europe and China. Before returning to academia in 2018, she worked in several Swedish government positions (among other things as Swedish Science Counselor in Beijing) and ran an independent think tank. During 2015/2016 she was senior advisor at the Swedish Prime Minister's Office for Strategic Development and she continues to advise governments on innovation policy and China. At EU level, she has chaired an expert group on international research and innovation cooperation and is currently member of the Expert Group on the Economic and Societal Impact of Research and Innovation (ESIR). She was an external expert in the OECD innovation reviews of Finland, Norway, South Korea and Germany, chair of the Austrian Council for Research and Technological Development, and member of the Swedish Prime Minister's Innovation

Council (2018-2021). She chairs the Scientific Council of the Swedish Research Council for Sustainable Development (Formas), and is a member of the International Advisory Board of the Norwegian Research Council. She chaired the board of the Swedish Foundation for Internationalization of Higher Education and Research (STINT) until 2022 and is academician at the Swedish Royal Academy of Engineering. From 2013-2016 she was Guest Professor at the Chinese Academy of Sciences Institute for Policy Management (CASIPM). Sylvia has an MA in International Relations from the Johns Hopkins School of Advanced International Studies (SAIS) and a PhD in economic history from the London School of Economics and Political Science. From 2018-2020 she was Deputy Vice Chancellor of Lund University. She is currently a Senior Research Fellow at MERICS.

**Markus Taube** holds the Chair for East Asian Economic Studies / China as a faculty member of the Mercator School of Management. He is the Director of the IN-EAST School of Advanced Studies at the University of Duisburg-Essen. Before joining the University of Duisburg-Essen he worked at the ifo Institute for Economic Research, Munich. He is a founding partner of THINK!DESK China Research & Consulting.

**Emily S. Weinstein** is a Research Fellow at Georgetown's Center for Security and Emerging Technology (CSET), focused on U.S. national competitiveness in AI/ML technology and U.S.-China technology competition. She is also a Nonresident Fellow at the Atlantic Council's Global China Hub and the National Bureau of Asian Research. In her previous role at CSET, Emily conducted research on China's S&T ecosystem, talent flows, and technology transfer issues. Emily has previously testified before the U.S.-China Economic and Security Review Commission and the Wisconsin State Legislature's Senate Committee on Universities and Technical Colleges. She has written on topics related to research security and China's S&T developments in Foreign Policy, Lawfare,



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**Siwen Xiao** is a research associate at the UC Institute on Global Conflict and Cooperation. Before joining IGCC, Xiao received her MIA degree specialized in international politics and China from the School of Global Policy and Strategy (GPS) at UC San Diego in 2021. At GPS, she also worked as a research assistant with focuses on quantitative research, China's industrial policies, and China's S&T systems. Her current research interests include China's political economy, industrial policies, and U.S.-China relations. Her areas of expertise include China's political economy, industrial policy, and U.S.-China relations.

**Yaosheng Xu** is a research associate at the Institute on Global Conflict and Cooperation (IGCC) at the University of California, San Diego (UC San Diego), where his research focuses on innovation policies, political economy, and Chinese politics. Xu received his Master's degree in international affairs from the School of Global Policy and Strategy at UC San Diego. He specializes in innovation policy, political economy, and China studies.

**Max J. Zenglein** is chief economics at MERICS. His research focuses on China's macroeconomic development, international trade and industrial policies. He has a particular interest in China's evolving economic system and the economic conditions in Hong Kong, Macau, and Taiwan. Max has over ten years of professional experience working on China-related economic issues. Before joining MERICS he was an economic analyst for the German Chamber of Commerce in Shenzhen and Beijing. He is an economist by training and has studied at the University of New York at Buffalo, the Berlin School of Economics and Law, the University of Hong Kong and the University of Kassel. He

received his PhD from the University of Kassel in 2015.