

Nomination letter for Wolfgang Lutz for IUSSP Laureate Award 2024

To: Dr. Mary Ellen Zuppan
Executive Director, IUSSP

Dear Mary Ellen,

We are delighted to nominate Wolfgang Lutz for the 2024 IUSSP Laureate Award. We enclose Wolfgang's CV for further information about his record. His CV contains the list of publications cited in the nomination letter.

Wolfgang is one of the world's leading demographers because of his breadth of research interest, exceptional publication record, outstanding organization skills, and remarkable record in interdisciplinary research. He combines a global focus and a strong involvement with policy-relevant key international institutions. Wolfgang's research has been relevant and innovative and has a lasting impact far beyond demography.

Currently, Wolfgang serves as acting Director General of the International Institute for Applied Systems Analysis (IIASA), one of the world's leading institutions in global sustainable development research. He is a top advisor in the UN on progress towards the SDGs and has recently been appointed special advisor to the Vice President of the European Commission on Democracy and Demography.

Wolfgang is one of the very few demographers who publishes extensively in the leading interdisciplinary journals. Of his over 300 scientific publications, 22 are in *Science*, *Nature* and *PNAS*. He also has 27 publications in *Population and Development Review*. Wolfgang's research encompasses globally relevant issues, with a particular focus on human capital, population dynamics, and population forecasting. Wolfgang also made major contributions to demographic theory by developing multi-dimensional demography and its application to human capital modelling. He recently summarized these advances in demographic theory, modelling and applications in a 2021 book "**Advanced Introduction to Demography**".

Wolfgang also advanced the innovative field of population-environment analysis starting in the late 1980s, and he has a significant impact on the IPCC (Intergovernmental Panel on Climate Change) reports on climate change. He established the Wittgenstein Centre for Demography and Global Human Capital and played a key role in setting up and strengthening demographic institutes in Asia and Africa. As IUSSP Secretary General, he fundamentally reformed the Union and brought it into the 21st century. In recognition of his scientific contributions, he received several high-level awards and was elected to six Academies of Sciences including in the US—National Academy of Sciences and The World Academy of Sciences. Wolfgang's remarkable career and contribution to science have been recognised in prestigious awards, including the 2009 Mattei Dogan Award of the IUSSP, the 2010 Wittgenstein Award in Austria, the 2016 EAPS Award for Population Studies, and the 2016 Mindel Sheps Award (the highest accolade for mathematical demography of the Population Association of America), and, most recently the 2023 Science Prize of the Austrian Research Association. Wolfgang has been successful in securing research grants that helped him build his research teams, including three prestigious ERC grants. The latest, an ERC Advanced Grant, was awarded in 2016 to study *The Demography of Sustainable Global Wellbeing*.

We will now elaborate Wolfgang's contributions to scientific research, institution-building, policy advice, and IUSSP in more detail.

1 Advancing multi-dimensional demography and population forecasting

Building on the work of Nathan Keyfitz, Andrei Rogers and others, multi-dimensional demography models population changes by more than the conventional age and sex. By further developing and widely applying this multi-dimensional approach, Wolfgang demonstrated how the changing composition of populations with respect to several additional important characteristics of people – such as level of education, place of residence, labor force participation – lies behind many consequential social and economic changes that can be forecasted. He has applied this multi-dimensional approach to assessing the economic consequences of human capital formation, to forecasting the adaptive capacity to climate change, and to the changing pattern of European versus national identity.

From the late 1980s onwards, Wolfgang made important contributions and methodological advances to population forecasting. He was among the early developers and users of the methods of probabilistic projections to project the world population. He was the first author of a unique series of three papers on world population futures in the globally leading journal *Nature*: In 1997 on decelerating population growth (“Doubling of world population unlikely”), in 2001 (“The end of world population growth”), and in 2008 “The coming acceleration of global population ageing”, which highlights a shift in attention from population growth to age structure. Wolfgang edited two special issues of journals on methods of population forecasting: *Population and Development Review* 1998 (together with Jim Vaupel and Dennis Ahlburg) on “Frontiers of Population Forecasting” and *International Statistical Review* 2004 (together with Josh Goldstein) on “How to deal with uncertainty in population forecasting”. Furthermore, he edited five books on global population futures: “Future demographic trends in Europe and North America: What can we assume today” (1991), “The future population of the world: What can we assume today” (1996) and “The end of world population growth in the 21st century: New challenges to human capital formation and sustainable development” (2004), “World population and human capital in the 21st century” (OUP 2014) and “Demographic and human capital scenarios for the 21st century; assessments for 201 countries” (Joint Research Centre of the European Commission 2018).

2 Advancing the demography of human capital formation and its economic benefits

Wolfgang Lutz developed and promoted the demographic approach to education and human capital modelling. This approach offers a consistent scientific way to describe quantitatively the processes by which different levels of school enrollment in one period translate into adult educational attainment categories by age cohorts at later points in time. This approach was recently expanded to consider quality through skills-adjusted human capital estimates. Together with his team, he has applied this approach to all countries of the world, reconstructing consistent time series of educational attainment distributions and presenting alternative scenarios up to 2100. These rich new education estimates and projections are widely used in the research and policy community, most prominently as part of the SSP (Shared Socioeconomic Pathways) Scenarios in the climate change research and policy communities (where they are extensively cited in the newest IPCC reports). They are also used by influential think tanks and international bodies such as in the European Commission, UNDP, UNFPA and the World Bank.

Wolfgang used these new estimates and projections to demonstrate the multiple mid- and long-term benefits of investments in education, ranging from health and survival to economic growth and enhancing demographic transition to resilience to natural disasters and climate change and to

sustainable development in general. He published these findings in the world's most prestigious scientific journals such as *Science*, *Nature* and *PNAS*. Unlike earlier papers on the topic, his 2008 *Science* paper (with Jesus Crespo-Cuaresma and Warren Sanderson) "The demography of educational attainment and economic growth" showed a clear and significant positive effect of education on economic growth. Because it considered data on full attainment distributions by cohort rather than the conventional mean years of schooling, the paper also demonstrated the paramount importance of completing secondary education in broad segments of the population, presenting the first comprehensive statistical evidence quantifying the positive effect of secondary education on economic growth. This perspective was subsequently adopted in the Sustainable Development Goals (SDGs), which demanded high quality primary and secondary education for all girls and boys.

Wolfgang also produced several popular science books such as "Education First: From Martin Luther to Sustainable Development" (2017) and promoted these findings in many high-profile lectures. He also initiated the Wittgenstein Data Explorer which provides demographic and educational attainment reconstructions back to 1950 and scenarios to 2100 by age, sex and educational attainment (<http://dataexplorer.wittgensteincentre.org/wcde-v2/>).

3 Advancing the field of population-environment analysis

In the field of population-environment analysis, Wolfgang has made seminal contributions to research on population and climate change. Since he joined IIASA in 1985, Wolfgang started to interact with the IIASA research groups focusing on global environmental change. In the 1990s, he developed a series of population-development-environment (PDE) case studies on Mauritius, Namibia, Botswana, Mozambique, Cabo Verde and the Yucatan peninsula in Mexico. In 2002, he edited a PDR Special Supplement on "Population and Environment: Methods of Analysis". In 2001, he co-authored (with Brian O'Neill and Landis MacKellar) the first and so-far only comprehensive book on "Population and Climate Change". He was one of the very few demographers serving as lead author on IPCC Assessment Reports. He also co-edited special issues of the leading environmental journals *Ambio* and *Ecology and Society* on population and environment interactions. His research using multi-dimensional demographic scenarios to forecast societies' adaptive capacities to climate change has strongly influenced the currently dominant SSP scenarios used by IPCC and climate change research community.

4 Making Vienna a global centre of demography, including teaching

In the course of three decades Wolfgang has established Vienna as a global hub of demographic research, with close to 100 scholars engaged with population-related research and teaching at present.

In addition to leading the World Population Program at IIASA since 1994, in 2002 he was invited to also take on the directorship of the Institute of Demography at the Austrian Academy of Sciences with the goal to build up a competitive European demographic institute in Vienna. He managed to quickly expand and internationalize the institute which was renamed to "Vienna Institute of Demography" (VID). In 2010 he took a part-time chair in Social and Economic Statistics at the Vienna University of Economics (WU). When Wolfgang was awarded the highest science prize in Austria, the Wittgenstein Award in 2010, he used the associated funding to bring the three institutions engaged in population research—

VID, IIASA and WU—together to establish the Vienna area as a global demography hub. This *Wittgenstein Centre for Demography and Global Human Capital* (WIC) streamlined the research of the three institutes by developing a joint research agenda with the goal to build an internationally visible centre of excellence in demography. In 2019 Wolfgang convinced the University of Vienna to establish a separate Department of Demography with its own Doctoral School and an English Master Program in “Global Demography” and he moved there as Professor of Demography. With this change, the University of Vienna replaced the WU as partner in WIC and now serves as the WIC pillar focusing on demographic training. It already has a dozen doctoral students and the third cohort of Master students in Global Demography started in the fall of 2023.

Wolfgang was also instrumental in other scientific and outreach activities in Vienna. He initiated the WIC annual demographic conferences, established a new open-access journal, the *Vienna Yearbook of Population Research*, and launched a regular series of demographic data sheets.

5 Strengthening demographic institutes in Asia and Africa

In 1998, Wolfgang organized a consortium of Asian demographic research centres to apply jointly to a major call by the Wellcome Trust to establish regional centres of excellence in different parts of the world. Together with PIs from the College of Population Studies of Chulalongkorn University (Bangkok) and the National University of Singapore (NUS), the successful bid resulted in the establishment of the Asian MetaCentre for Population and Sustainable Development Analysis, including more than a dozen demographic centres around Asia and organizing many conferences and training workshops around the region. Later, Wolfgang was involved in setting up the Asian Demographic Research Institute (ADRI) in Shanghai, which currently serves as the headquarters of the Asian MetaCentre.

Wolfgang was also involved in establishing the African Population and Health Research Centre (APHRC) as an independent regional research centre. He served on its first Board of Directors (2002-09) as deputy chair of the Board and chair of its science committee. He thus played an important role in helping to build this leading pan-African demographic research centre.

6 Supporting IUSSP

Wolfgang became a member of IUSSP in 1983, the year he got his PhD in Demography from the University of Pennsylvania. He was elected to be IUSSP Secretary General for the period 1998-2001. This was a difficult time for the Union due to discontinued government support and a change in executive director. As Secretary General, Wolfgang managed a thorough review of IUSSP activities followed by a reorganization that resulted in the move of headquarters from Liège to Paris together with securing long-term support from the French government. He also was heavily involved in organizing the 2001 International Population Conference in Salvador de Bahia. Wolfgang brought the IUSSP into the 21st century, not only in terms of calendar, but also by establishing its website, www.iussp.org, and launching IUSSP cyber committees such as PERN which functions successfully up to this day.

7 Introducing “Human Resource Management” as a 21st century population policy paradigm

Wolfgang has been active in supporting national governments in Europe and Asia in strengthening their population-related policies. He has shown repeatedly that for concerns about changing population size (growth as well as shrinking) and ageing, labor force participation and human capital of the population matter more than headcount and age structure. He also applied this approach to the study of migration, establishing a collaboration between the European Commission and IIASA in the form of CEPAM (Centre for Population and Migration Analysis) and serving as advisor to the vice president of the European Commission for Democracy and Demography.

In conclusion, we cite statements of two distinguished colleagues on the back cover of his 2021 “Advanced Introduction to Demography”. Joel Cohen (Rockefeller University and Columbia University) writes:

“Wolfgang Lutz has secured his place among the handful of the world’s most influential demographers by decades of pioneering empirical research, theoretical exploration, and institutional leadership.”

John Weeks (San Diego State University and author of the most widely used population textbooks) adds:

“Wolfgang Lutz is one of the most accomplished demographers in the world ... he creates a unified demographic theory importantly incorporating education into our demographic view of the world.”

We fully agree and are convinced that Wolfgang deserves to be the 2024 IUSSP Laureate.

Tomas Sobotka, Anne Goujon, Marc Luy, and Alexia Fürnkranz-Prskawetz (Wittgenstein Centre for Demography and Global Human Capital, Vienna, Austria)

Alicia Adsera (Princeton University, United States)

Graziella Caselli (Sapienza University of Rome, Italy)

Joel E. Cohen (Rockefeller University and Columbia University, United States)

Eileen Crimmins (University of Southern California, United States)

Alex Ezeh (Drexel University, United States)

Stuart Gietel-Basten (The Hong Kong University of Science and Technology and Khalifa University of Science and Technology, United Arab Emirates)

Leiwen Jiang (Shanghai University and Population Council, United States)

Doo-Sub Kim (Hanyang University, Republic of Korea)

Elke Loichinger (Federal Institute for Population Research (BiB), Germany)

Nyovani Janet Madise (African Institute for Development Policy, Malawi)

Peter McDonald (University of Melbourne, Australia)

Raya Mutarak (University of Bologna, Italy)

Eduardo L. G. Rios-Neto (Instituto Brasileiro de Geografia e Estatística (IBGE), Brazil)