Nils Rochowicz
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www.inet.ox.ac.uk/people/nils-rochowicz

Cover Letter 13.02.2026

Dear selection committee,

Dear Members of the Selection Committee,

I am writing to apply to the NBER Innovation Boot Camp 2026. I am currently a DPhil student in Mathematics at the University of Oxford and a doctoral student in Economics at Chemnitz University of Technology. I previously completed a two-year MPhil in Economics at Oxford, where I received formal training in graduate-level microeconomics, econometrics, and quantitative methods.

In addition to my doctoral training, I have pursued focused coursework in the economics of innovation, including the MIT course taught by Professors Azoulay and Stern, as well as the Institute for Progress innovation program. These experiences have provided me with a strong foundation in the field, and I am eager to deepen my expertise—particularly in empirical and counterfactual approaches central to modern innovation economics.

Please find enclosed my research statement, curriculum vitae, and a transcript overview documenting my graduate-level economics coursework. A letter of recommendation has been submitted by my supervisor at Chemnitz University of Technology, Professor Torsten Heinrich (torsten.heinrich@wiwi.tu-chemnitz.de).

Thank you for considering my application. I would be pleased to provide any additional information if required.

Sincerely yours,

Nils Rochowicz

Nils Rochowicz

Research Statement 13.02.2026

Dear selection committee,

My research examines how policy and market forces shape the direction, pace, and economic consequences of technological change. I combine tools from the science of science and machine learning with causal inference and counterfactual economic modeling to study innovation. My objective is not only to forecast technological developments, but to embed prediction within economic frameworks that allow credible evaluation of policy and investment decisions.

In the first chapter of my PhD, I study episodes of rapid green innovation across countries. Using panel patent data and a causal inference framework, I identify structural increases in green patenting and link these innovation accelerations to specific climate policies and policy mixes. This approach allows me to move beyond average treatment effects and instead analyze when and under which institutional configurations policy induces large, sustained shifts in technological direction.

My second project examines the labor market consequences of automation technologies. Drawing on network-based measures of technological and occupational proximity, I construct forward-looking measures of workers' outside options as new technologies diffuse. I then study how shifts in these outside options affect wage bargaining and labor market inequality. This project connects technological change to equilibrium labor market outcomes, emphasizing how innovation reshapes economic opportunity structures.

In my third project, I model technological search directly. I build a predictive model of which technology codes are likely to be combined in a patent, using deviations from predicted combinations to measure technological novelty. These deviations are systematically related to forward citations and patent valuations, suggesting that economically valuable innovation often arises from unexpected recombinations. By modeling the expected space of technological search, this project provides a disciplined way to quantify exploration and risk in innovation.

Building on this work, I aim to develop a broader research agenda that treats innovation as an empirical investment problem. Firms and governments allocate resources under uncertainty across technologies with heterogeneous spillovers and social returns. I am interested in understanding how these allocations shape the long-run direction of technological change, and how predictive tools can be integrated into counterfactual policy analysis. In particular, I seek to combine structural economic reasoning with high-dimensional prediction to evaluate which investments are likely to generate socially valuable innovation.

The NBER Innovation Boot Camp is uniquely suited to advance this agenda. Engaging with research on knowledge spillovers and R&D policy, central to Prof. Williams' work, would sharpen my analysis of green innovation and policy complementarities. Prof. Myers' and Dr. Clancy's work on firm strategy and innovation would deepen my understanding of firm-level investment decisions, while Prof. Jones' research on idea production and growth provides a natural framework for embedding prediction into models of long-run technological change. More broadly, the boot camp's emphasis on rigorous empirical methods in innovation economics would strengthen the counterfactual and structural components of my work.

I aim to contribute to the program by bringing perspectives and tools from the science of science and predictive modeling into dialogue with economic theory and policy analysis. By integrating these approaches, my research seeks to provide empirically grounded guidance on how innovation can be fostered and directed toward socially beneficial outcomes.

Sincerely yours,

Nils Rochowicz

Nils Rochowicz

Curriculum Vitae

Education

Fall 2025 **Research Visit**, *Growth Lab, Harvard Kennedy School of Government*,
Supervisors: Prof. Ricardo Hausmann and Prof. Muhammed Yildirim.

2021–Present (exp 2027) **PhD in Economics**, *Chemnitz University of Technology, Department of Economics*,
Supervisor: Prof. Torsten Heinrich.

2017–Present (exp 2026) **DPhil (PhD) in Mathematics**, *University of Oxford, Mathematical Institute and Institute for New Economic Thinking*,
Supervisors: Prof. Doyne Farmer, Prof. Neave O'Clery, Prof. Renaud Lambiotte,
Title: Link Prediction in Technology Networks.
(On medical leave 2019-2021)

2015–2017 **MPhil in Economics**, *University of Oxford and Mansfield College*,
Master's Thesis: 'The Scientific and Monetary Value of Patents and their Relationship: A Network Perspective', Grade – 69, Top 25% of the Cohort
Supervisors: Prof. Doyne Farmer and Prof. Peyton Young.
Specialization: Microeconomic Theory, Innovation Economics, Development Economics

2011–2015 **BSc in Economics and Business Administration**, *University of Tübingen*,
Final Grade – 1.28, Top 5% of the Cohort.
Specialization: Microeconomic Theory, Innovation Economics

Publications and Advanced Work in Progress

Rochowicz, N., Heinrich, T., O'Clery, N., Farmer, D., (2026). Network Structure and Link Prediction in Technological Recombination, *INET Working Paper, forthcoming*

Kloesel, P., Rochowicz, N., Konrad, L. D., Menicacci, L., Romero-Fernandez, L, Stechemesser, A., Koch, N. (2026). Attributing Increases in Green Patenting to Disruptive Climate Policies, *OECD Working Paper, forthcoming*

Uhlig, M., Weyh, A., Rochowicz, N. (2026). Clustered Shocks on Labour Flow Networks Worsen Employment Outcomes for Workers, *IAB Working Paper, forthcoming*

Kerl, J., Rochowicz, N., Heinrich, T. (2026). Forecasting Innovation Rates of Energy Storage Technologies, *Chemnitz University Working Paper, forthcoming*

Rochowicz, N. (2024). Planning Progress: Incorporating Innovation and Structural Change into Models of Economic Planning, *Competition and Change*, Link

Le Lannou, A., Rochowicz, N., Kuhls, S., Gräbner-Radkowitsch, C., Hafele, J., (2023). Securing Future-Fit Jobs in the Green Transformation: A Policy Framework for Industrial Policy, *ZOE Working Paper*, Link

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Website

Selected Presentations and Invited Talks

2026 Geography of Innovation (GeoInno) Conference

2025 Center for International Development Seminar Harvard Kennedy School, Growth Lab Academic Seminar, Conference on Economic Complexity

2024 Conference on Economic Complexity, European Association for Evolutionary Political Economy, Bessemer Symposium on Economic Geography, Utrecht University Department of Innovation Studies Seminar

2023 Forum for Macroeconomics and Macroeconomic Policy, Association for Heterodox Economics, 4^{th} Pluralumn* Meeting, German Network for Economic Dynamics

2022 European Association for Evolutionary Political Economy

2021 Rethinking Innovation (IIPP UCL), Oxford Economics Society

2019 Conference on the Geography of Innovation and Complexity (Utrecht), European Association for Evolutionary Political Economy, Rethinking Innovation (IIPP UCL)

2018 Geography of Innovation (GeoInno) Conference, Conference on the Geography of Innovation and Complexity (MIT), World Economic History Congress, Trento Festival of Economics

2017 YSI Festival of Economics

Awards and Scholarships

2026 Attila Varga Early Career Award for the best paper by a young scholar presented at the Geography of Innovation conference

2022 Invited Participant at the Lindau Nobel Laureate Meeting, *5'000 €*

2016–2017 German National Merit Foundation, *For Outstanding German Students at all Levels of Study*

2015–2017 German Academic Exchange Service, *Scholarship for Promising Students to Pursue a Graduate Degree Abroad*

2016–2017 Baden-Württemberg Foundation, *Scholarship for Outstanding Performance in the B.Sc. to Support Students for an Exchange Semester*

2011–2015 e-Fellows.net Fellowship, *For Outstanding Performance in the A-Levels*

Work Experience

2020–2021 **Research and Business Analyst**, *German Federal Agency for Disruptive Innovation SPRIND*.
Analysis of New Technologies for their Innovative and Business Potential, with a Special Focus on Technologies with Exceptionally High Societal Benefits

2017 **Research Assistant**, *University of Oxford, Oxford Martin School Programme on Technological and Economic Change*, Supervisor: Prof. Ian Goldin.
Literature Review on the Determinants of Firm Productivity. Paper published in JEL, Link

2015 **Internship**, *Institute for New Economic Thinking*, New York.
Management and Strategic Vision of the Young Scholars Initiative

2014 **Internship**, *University of Oxford, Institute for New Economic Thinking at Oxford*, Supervisor: Prof. Doyne Farmer.
Project on Agent-Based Modeling and Model Calibration for Financial Stability

Teaching Experience

WS 2025 **Seminar Supervisor**, *Chemnitz University of Technology*,
'Innovation and Technological Progress: Measurement, Prediction, Policy', Masters seminar.

WS 2023 **Seminar Supervisor**, *Chemnitz University of Technology*,
'The Robots are Coming: Evaluating the Economics of Generative AI', Masters seminar.

WS 2022 **Seminar Supervisor**, *Chemnitz University of Technology*,
'Predicting the Future: Forecasting in Innovation and Development Economics', Masters seminar.

2021–present **Teaching Assistant**, *Chemnitz University of Technology*.
'Innovation Economics', 'Introductory Microeconomics', 'Introduction to Economics'

2018–2019 **Teaching Assistant**, *University of Oxford, Mathematical Institute*.
'Mathematics and Data Science for Development'

2012–2015 **Teaching Assistant**, *University of Tübingen*.
'Mathematical Methods', 'Explorative Data Analysis', 'Risk & Probability', 'Microeconomics'

Thesis Supervision (selection)

Masters Thesis (Total: 6)

SS 2025 How Germany's Occupational Network Shapes Unemployment under Automation Shocks: A Data-Driven Modeling Approach using IAB Microdata

SS 2024 Predicting Patenting Rates for Energy Storage Technologies via Networks-Based Metrics – CWG Thesis Prize awarded

WS 2023 The Job Shopping Theory: An Empirical Analysis of Job Mobility after Apprenticeship Training in Eastern Germany – Marie-Pleissner Thesis Prize 2025 awarded

WS 2023 Forecasting Learning Curves for Energy Storage Technologies using Early Indicators

Bachelors Thesis (Total: 3)

WS 2022 The Impact of AI on Labor Market Polarization: An Overview of Frameworks Examining Occupational Exposure – CWG Thesis Prize awarded

Organizing and Community Service

2021 **Conference 'Rethinking Innovation: The State, Markets, and Society in Times of Upheaval'**, *Co-Organizer*, Institute for Innovation and Public Purpose, UCL (hybrid).
LINK

2019 & 2020 **Conference on the Geography of Innovation and Complexity**, *Co-Organizer*, University of Utrecht (2019), online (2020).
LINK

2017 & 2018 **Oxford Summer School in Economic Networks**, *Co-Organizer*, University of Oxford.
LINK

2015–2019 **Rethinking Economics Oxford**, *Founder and Lead Organizer*.
Organization of Guest Lectures, Reading Groups, and Debates

2017–2020 **Complexity Economics Working Group**, *Coordinator*, Young Scholars Initiative.
Organization of Conferences and Events to Promote Advanced Mathematical Methods for Economics, Mentoring of Several Students

2014–2015 **European Coordinator**, *Young Scholars Initiative*, Institute for New Economic Thinking.
Coordination of Local Activities of YSI across European Universities, Supporting New Members and Groups, Providing Expertise on Conference Organisation

2014 **Conference 'New Economic Thinking for a Complex Evolving Financial System'**, *Co-Organizer*, De Nederlandsche Bank and Institute for New Economic Thinking.
10 Keynote Speakers, 20 Workshops, 150 Participants, 40'000€ Budget, 4 days

2014 **Conference of the 'International Student Initiative for Pluralism in Economics'**, *Lead Organizer*, University of Tübingen.
1 Keynote Speaker, 60 Participants, 30'000€ Budget, 5 days

2012 2^{nd} **Rethinking Economics Conference**, *Co-Organizer*, University of Tübingen.
5 Keynote Speakers, 60 Participants, 5'000€ Budget, 3 days.

2012–2015 **Rethinking Economics Tübingen**, *Lead Organizer*.
Organization of Weekly Discussion Groups, Reading Groups, and Panel Discussions

2012–2015 **Tübingen Economics Forum**, *Lead Organizer*.
Organization of a Weekly Discussion Forum on Current Political and Economic Issues

2009–2013 **Initiative for a Local Youth Council**, *Founder & Lead Organizer*, Sindelfingen, Germany.
Lobbying the Local Council and Administration to Install a Youth Council to Enhance Youth Participation in Local Politics. The Council is Running Successfully in its sixth Election Period.

Impact and Outreach

2026 Expert Testimony delivered to the Parliament of the State of Berlin in the Hearing on 'Berlin as an International Centre for Deep-Tech Companies'

Academic Administration Service

2022 Member of the Hiring Committee for the Junior Professorship in Economics at Chemnitz University of Technology

2021–Present Student Advisor for the M.Sc in Economics at Chemnitz University of Technology

2021–Present Member of the Academic Commission and the Examination Board of the M.Sc. in Economics, Jointly Responsible for the Reaccreditation of the Degree in 2024

Programming skills

Advanced R, Python, LaTeX

Basic Java, MatLab, Stata

Languages

Fluent German (native), English

Intermediate Spanish, French, Danish

Interests

- Reading
- Music
- Chess (Oxford University 2^{nd} team)
- Windsurfing
- Soccer

UNIVERSITY OF OXFORD

ACADEMIC TRANSCRIPT

Personal Information

Student:	Nils David ROCHOWICZ	Date of Birth:	24 November 1993
University Reference:	850275	HESA Reference:	1511565017972
Qualification Sought:	Master of Philosophy	FHEQ Level:	Masters
Start Date:	11 October 2015	End Date:	29 June 2017

Programme Information

Teaching Institution:	University of Oxford	Awarding Institution:	University of Oxford
College:	Mansfield College	Mode of Attendance:	Full-time
Programme of Study:	Master of Philosophy in Economics	Language of Instruction:	English

Award Information

Qualification Awarded:	Master of Philosophy
Classification:	Pass
Date of Award:	29 June 2017

Assessment Information

Academic Year	Assessment Name	Result Mark/Grade	Attempt Number
2015/16	Econometrics	60	1
2015/16	Macroeconomics	58	1
2015/16	Microeconomics	64	1
2016/17	Advanced Microeconomics 1	66	1
2016/17	Development Economics 2	62	1
2016/17	Economic History 1	64	1
2016/17	Public Economics	62	1
2016/17	Thesis	69	1
2016/17	Urban Spatial Economics	60	1

Postgraduate Taught Programmes in Economics follow the normal marking scheme, with a passing mark of 50.

End of Transcript



Registrar

THE UNIVERSITY OF OXFORD

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About the University of Oxford

The University of Oxford is an independent self-governing university. It is the oldest university in the English-speaking world and has been in continuous existence for some nine centuries. It is an international leader in learning, teaching and research. As a collegiate institution, it comprises the central university and 38 colleges and 6 permanent private halls.

University of Oxford Transcripts

The transcript should not be released to another person, organisation or institution except to officials internal to your own organisation or institution who have a reasonable business use for the information. Release to other parties requires the written consent of the student. The following information is provided to aid in the evaluation of this student's academic record. Further explanation or detailed information can be obtained by contacting Degree Conferrals at the above address.
Under University regulations, Boards of Examiners may, where appropriate, take account of information additional to the profile of marks listed overleaf in deciding the final degree classification awarded to any student.
The explanatory text on the transcript is subject to change until such time that the programme of study is completed.

Academic Credit

The University does not routinely apply credit weightings to its programmes and its courses are not generally taught on a modular basis. We take each year of full-time undergraduate study to equal 120 UK credits and 180 UK credits for postgraduate study according to the Higher Education Credit Framework for England. In relation to the European Credit Transfer Scheme (ECTS), this is equivalent to 60 credits for undergraduate study and 60-90 credits for postgraduate study.

Framework for Higher Education Qualifications (FHEQ levels)

8 (Doctoral)	Doctor Degrees (e.g. PhD, DPhil)
7 (Masters)	Master's Degrees (including Integrated Master's Degrees) Postgraduate Diplomas Postgraduate Certificates
6 (Honours)	Bachelor's Degrees with Honours
5 (Intermediate)	Ordinary/Pass Bachelor's Degrees

Mark Scales

All marks included on a final academic transcript have been ratified by the Deputy Registrar. Examiners are required to express final agreed marks on all formally assessed work according to the following marking scales:

Undergraduate Programmes

70-100	First Class
60-69	Upper Second Class
50-59	Lower Second Class
40-49	Third Class
30-39	Pass
0-29	Fail

Postgraduate Taught Programmes*

70-100	Distinction
50-69	Pass
0-49	Fail

*A number of programmes follow an alternative set of boundaries:

70-100	Distinction
60-69	Pass
0-59	Fail

Transcript Terminology

Result Not Moderated (On Course Transcripts Only): Indicates a mark that may be subject to moderation in the process of concluding the final outcome of an examination comprising more than one part and taken over more than one year.

Programme Information

The relevant *Examination Regulations* for the programme are available at:
https://www.admin.ox.ac.uk/examregs/

Authentication

This academic transcript can only be considered authentic if it is printed on official University of Oxford transcript paper and bears both the Registrar's signature and the official University hologram. Further authentication may be obtained by contacting Degree Conferrals at the address above.

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CHEMNITZ

Faculty for Economics and Business Administration
VWL II - Microeconomics
Prof. Dr. Torsten Heinrich

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Phone: +49 371 531-39097
E-Mail: torsten.heinrich@wiwi.tu-chemnitz.de
Internet: www.tu-chemnitz.de/wirtschaft/vwl2

Place, Date: Chemnitz, 12/2/2026

Brett Maranjian
NBER
1050 Massachusetts Avenue
Cambridge, MA 02138
USA

Letter of Recommendation

To whom it may concern,

I am very pleased to support the application of Mr. Nils Rochowicz to the NBER Innovation Research Bootcamp. I supervise Nils as a PhD student in economics at Chemnitz University of Technology, and I consider him to be one of the most promising young researchers I have worked with.

From the beginning of his PhD, Nils has distinguished himself through an unusually clear research vision and a strong command of both economic theory and data-intensive empirical methods. His work focuses on the economics of technological change, innovation networks, and technological recombination, combining large-scale patent data with tools from network science and information theory. This places him squarely at the frontier of modern innovation economics, both substantively and methodologically.

Nils' research addresses core questions in the field: how new technologies emerge from existing knowledge, how path dependence shapes innovation trajectories, and how novelty can be rigorously measured. His work develops novel empirical measures of technological relatedness and innovation novelty, with direct relevance for understanding R&D dynamics and innovation policy. Parts of this work are already published or forthcoming, and his ongoing projects are of a quality that I expect will place them in leading journals in innovation and applied economics. This is further evidenced by the fact that Nils has recently won the Attila Varga Early Career award for the best paper by a young scholar at the Geography of Innovation (GeoInno) conference.

I am confident that the NBER Innovation Research Bootcamp would be extremely valuable for Nils at this stage of his PhD, helping him further sharpen his research agenda and connect his work to the broader innovation economics community. At the same time, I am equally confident that he would make a strong contribution to the bootcamp through the originality, rigor, and ambition of his research.

Sincerely yours,



Torsten Heinrich

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Postal address: Technische Universität Chemnitz · 09107 Chemnitz · GERMANY

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