Dr. Simon Weiler
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Professional Appointments

- **Sep 2022 – Present:** Senior Research Fellow, Margrie Lab, Sainsbury Wellcome Centre (UCL), London, UK.
- **Sep 2019 – Apr 2025:** Part-time Research Fellow (10%), Animal Navigation, Carl-von-Ossietzky Universität Oldenburg, Germany.
- **Jul 2019 – Aug 2022:** Research Fellow, Margrie Lab, Sainsbury Wellcome Centre (UCL), London, UK.
- **Aug 2018 – Jun 2019:** Research Fellow, Max Planck Institute of Neurobiology, Martinsried, Germany.

Higher Education

- **2013 – 2018: PhD in Neuroscience**, Graduate School of Systemic Neurosciences, Ludwig-Maximilians-Universität (LMU), Max Planck Institute of Neurobiology, Germany.
- **2011 – 2013: MSc in Neuroscience**, International Max Planck Research School (IMPRS), Georg-August-Universität Göttingen, Germany. GPA: 1.5.
- **2007 – 2010: BSc in Biology**, Carl-von-Ossietzky Universität Oldenburg, Germany / University of Queensland, Australia. GPA: 1.2.

Research Experience & Impact

Sainsbury Wellcome Centre (UCL) | Lead Researcher (2019 – Present)

- **Advanced Imaging:** Developed custom 3-photon imaging pipelines for functional mapping of deep-layer cortical circuits.
- **Methodological Innovation:** Engineered solutions to eliminate off-target artifacts during simultaneous Neuropixels recording and optogenetic stimulation.
- **Global Collaboration:** Established international partnerships to construct 3D digital brain atlases across species.

Max Planck Institute of Neurobiology | PhD Researcher (2013 – 2019)

- **Functional Connectomics:** Bridged neural activity and synaptic connectivity by integrating *in vivo* profiling with *in vitro* circuit mapping.
- **Optogenetics:** Established dual-color optogenetic approaches to map eye-specific retinogeniculate convergence.

Selected Awards & Honors

- **2025:** International Prize Winner, The Neuro - Irv and Helga Cooper Foundation Open Science Prize (BrainGlobe Initiative).
- **2024:** SWC/GCNU 3Rs Award for Animal Welfare, UCL.
- **2024:** Award for Outstanding Performance (Merit-based increment), UCL.
- **2020 – 2022:** Feodor Lynen Research Fellowship, Alexander von Humboldt Foundation.
- **2011 – 2013:** Awarded merit-based Scholarship via International Max Planck Research School for Neuroscience

Technical Expertise

- **Surgical Methods:** Expert in aseptic surgeries, precision stereotaxic viral/tracer injections, cranial window implantation for 2-photon/3-photon imaging, optical fiber implantation and callosotomies.
- **Imaging:** Expert in *in vivo* 2-photon /3-photon calcium imaging, custom setup maintenance, and serial 2-photon tomography for whole-brain imaging (mouse, birds, bats).
- **Electrophysiology:** Advanced *in vivo* Neuropixels recordings and *in vitro* patch-clamp paired with multi-color optogenetics.
- **Data Analysis & Programming:** 10+ years MATLAB experience; expertise in dimensionality reduction (PCA/t-SNE), manifold analysis, and BrainGlobe 3D reconstruction.

Teaching, Leadership & Service

- **Designated Surgical Trainer (2021 – Present):** Lead instructor for aseptic and stereotaxic surgical procedures at SWC.
- **Staff Selection Committee (2022 – Present):** Member of the SWC recruitment committee for new staff members.
- **Mentorship:** Co-supervising multiple PhD and MSc candidates at UCL, Max Planck Institute and University of Oldenburg.
- **Lecturer:** Systems & Theoretical Neuroscience (Synaptic Transmission and Plasticity), UCL.
- **Academic Service:** Peer Reviewer for international journals (e.g. *Current Biology* and *The Journal of Physiology*).
- **Outreach:** Co-organized "Day of the Open Door" at Max Planck Institute; Invited speaker for UK high schools.

Publications

- **Weiler S.**, et al. (2026) Protocol for minimizing off-target neuronal activation during optical stimulation *in vivo*. ***STAR Protocols*** (accepted).
- Sirmpilatze N.*, … **Weiler S.** (2025) Mapping the magnetoreceptive brain: A 3D digital atlas of the migratory bird Eurasian blackcap. ***bioRxiv***.
- **Weiler S.**, et al. (2025) Layer 6 corticocortical neurons are a major route for intra- and interhemispheric feedback. ***eLife*** 13:RP100478.
- **Weiler S.**, et al. (2024) Overcoming off-target optical stimulation-evoked cortical activity in the mouse brain in vivo. ***iScience***, 27, 111152
- **Weiler S.**, et al. (2024) A feedforward-inhibition based cortico-cortical circuit for tactovisual convergence in mouse proximity space. ***Nature Communications*** 15, 3081.
- Stark A.W., … **Weiler S.**, et al. (2023) Stereophotogrammetry with active structured illumination for measuring mouse whiskers in 3D. ***DGaO-Proceedings*** ISSN: 1614-8436
- **Weiler S.***, et al. (2022) Functional and structural features of L2/3 pyramidal cells continuously covary with pial depth in mouse visual cortex. ***Cerebral Cortex*** 33 (7), 3715-3733
- **Weiler S.***, et al. (2022) Orientation and direction tuning align with dendritic morphology and spatial connectivity in mouse visual cortex. ***Current Biology*** 32 (8), 1743-1753.
- Bauer J.*, **Weiler S.***, et al. (2021) Limited functional convergence of eye-specific inputs in the retinogeniculate pathway of the mouse. ***Neuron*** 109, 1–12.
- **Weiler S.**, et al. (2018) High-yield *in vitro* recordings from neurons functionally characterized *in vivo*. ***Nature Protocols*** 13, 1275-1293.
- **Weiler S.**, et al. (2014) ATP hydrolysis is critically required for function of Cav1.3 channels in cochlear inner hair cells via fueling Ca2+ clearance. ***Journal of Neuroscience*** 34 (20), 6843-6848
- Zapka M., … **Weiler S.**, et al. (2009) Visual but not trigeminal mediation of magnetic compass information in a migratory bird. ***Nature*** 461, 1274-1277.

Invited Talks (Selected)

- **2025:** University of Sussex, UK – Layer 6 mediates intra and interhemispheric cortical feedback to modulate primary sensory processing.
- **2024:** European Visual Cortex Meeting, Italy – Layer 6 corticocortical cells dominate the anatomical organization of intra and interhemispheric feedback.
- **2018:** Salk Institute, USA – Integrated circuit analysis of the mouse visual system.

Volunteering

- **2011:** Marine Conservation Volunteer (Shark cage diving operations), South Africa.
- **2011:** Community Volunteer, Belthorn Primary School, Cape Town, South Africa.