# Ji Xia

## Current Appointment

**Columbia University, Zuckerman Institute** **2021-**
Postdoctoral Research Scientist
Computational neuroscience, Advisor: Kenneth D. Miller

## Education

**Washington University in St. Louis** **2015-2021**
Ph.D. in Physics
Computational neuroscience, Advisor: Ralf Wessel

**Nankai University** **2011-2015**
B.S. in Applied Physics

## Awards

**National Institutes of Health** **2025-2027**
NINDS K99/R00 Pathway to Independence Award
Computational Approaches for Understanding Multi-Area Circuit Mechanisms Underlying Memory-Guided Movements
1K99NS144599-01

**Washington University in St. Louis** **2017-2019**
Imaging Science Pathway Trainee Fellowship Award

**Washington University in St. Louis** **2015**
Arthur L. Hughes Fellowship

## Publications

**Xia J**, Zhang Y, Wang S, Allen G, Paninski L, Hurwitz C, Miller KD.
Inpainting the Neural Picture: Inferring Unrecorded Brain Area Dynamics from Multi-Animal Datasets.
*NeurIPS* (2025).

**Xia J**, Jasper A, Kohn A, Miller KD.
Circuit-motivated generalized affine models characterize stimulus-dependent visual cortical shared variability.
*iScience* (2024).

**Xia J**, Marks TD, Goard MJ, Wessel R.
Stable representation of a naturalistic movie emerges from episodic activity with gain variability.
*Nature Communications* (2021).

**Xia J**, Marks TD, Goard MJ, Wessel R.
Diverse co-active neurons encode stimulus-driven and stimulus-independent variables.
*Journal of Neurophysiology* (2020).

Johnson JK, Wright NC, **Xia J**, Wessel R.
Single-cell membrane potential fluctuations evince
network scale-freeness and quasicriticality.
*Journal of Neuroscience* (2019).

Hoseini MS, Wright NC, **Xia J**, Clawson W, Shew W, Wessel R.
Dynamics and sources of response variability and its
coordination in visual cortex.
*Visual Neuroscience* (2019).

## Conferences

**Xia J**, Zhang Y, Wang S, Allen G, Paninski L, Hurwitz C, Miller KD.
Inpainting the Neural Picture: Inferring Unrecorded Brain Area Dynamics
from Multi-Animal Datasets
*Cosyne* (2026, poster).

**Xia J**, Zhang Y, Wang S, Allen G, Paninski L, Hurwitz C, Miller KD.
Inpainting the Neural Picture: Inferring Unrecorded Brain Area Dynamics
from Multi-Animal Datasets
*NeurIPS* (2025, poster).

**Xia J**, Zhang Y, Wang S, Allen G, Paninski L, Hurwitz C, Miller KD.
Inpainting the Neural Picture: Inferring Unrecorded Brain Area Dynamics
from Multi-Animal Datasets
*Society for Neuroscience* (2025, poster).

**Xia J**, Jasper A, Kohn A, Miller KD
Generalized affine models explain stimulus-dependent correlated
variability within and across V1 and V2
*Society for Neuroscience* (2023, poster).

**Xia J**, Miller KD
Generalized models explain signal-dependent correlated
variability within and between V1 and V2
*Cosyne* (2022, poster).

**Xia J**, Miller KD
Generalized models explain signal-dependent correlated
variability within and between V1 and V2
*Simons Collaboration on the Global Brain annual meeting* (2022, poster).

**Xia J**, Marks TD, Goard MJ, Wessel R.
Stable representations of natural movie emerge from
unstable single neuron responses.
*Bernstein Conference* (2021, invited talk at workshop).

**Xia J**, Marks TD, Goard MJ, Wessel R.
Stable representations of natural movie emerge from unstable single neuron responses.
*Cosyne* (2021, poster).

**Xia J**, Marks TD, Goard MJ, Wessel R.
Stable representations of natural movie emerge from unstable single neuron responses.
*Bernstein Conference* (2020, poster).

**Xia J**, O'Neill P, Goard MJ, Wessel R.
Skewed distribution of response reliability in mouse V1. across different types of visual stimuli.
*Society for Neuroscience* (2019, poster).

**Xia J**, O'Neill P, Goard MJ, Wessel R.
Firing rate, response reliability, and correlated variability distributions are similar in cortical layer 2/3 and 4 of mouse V1.
*Society for Neuroscience* (2018, poster).

**Xia J**, O'Neill P, Goard MJ, Wessel R.
Network criticality in mouse visual cortex coincides with high single-neuron response variability, but low correlated variability.
*Society for Neuroscience* (2017, poster).

## Workshops

TorchBrain Buildathon (**Upenn**) **2025**
NeuroDataReHack (**HHMI Janelia**) **2025**
Mining and modeling neuroscience data (**UC Berkeley**) **2018**
Computational and cognitive neuroscience (**NYU Shanghai**) **2017**

## Teaching

**Columbia University** **2022-2026**
Guest lecturer and Co-organizer
Seminar on Advanced Topics in Theoretical Neuroscience

**Neuromatch** **2021, 2023**
Mentor
Computational neuroscience

**Washington University in St. Louis** **2016-2019**
Teaching Assistant
Physics of Vision, Physics of Brain, Intro-Physics,
Machine learning workshop

## Reviewer

Cosyne, NeurIPS workshop, Nature Communications