Clayton Seitz

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EDUCATION

Doctor of Philosopy, Physics
Purdue University, Indianapolis, IN
Advisor: Dr. Jing Liu (2018-2020, 2022-Present)
Thesis: *In progress*

Master of Science, Biophysics
University of Chicago, Chicago, IL, 2021
Thesis: *Stable cell assembly formation in excitatory-inhibitory neuronal networks*

Bachelor of Science, Physics, Magna cum laude
Purdue University, Indianapolis, IN, 2019
Minor: Mathematics

Bachelor of Science, Informatics, Magna cum laude
Luddy School of Informatics, Computing, and Engineering, Indiana University Bloomington, 2019
Concentration: Mathematics

RESEARCH EXPERIENCE

Doctoral Researcher 2022-Present
Indiana University - Purdue University, Indianapolis, IN

- Build a widefield fluorescence microscope capable of multi-color live cell imaging, high-throughput tiled acquisiton, and super-resolution
- Use analytical techniques and Monte Carlo simulations to study transcriptional dynamics in mammalian cell models
- Analyze transcriptional dynamics at pro-inflammatory gene clusters during cytokine exposure

Graduate Trainee 2020-2022
University of Chicago, Chicago, IL

- Utilize fluorescence microscopy to measure calcium dynamics in single cells
- Generate Monte Carlo simulations of spiking neural networks to relate network architecture to spiking dynamics

Undergraduate Research Assistant 2019-2020
Indiana University - Purdue University, Indianapolis, IN

- Develop an image processing package in Python for processing large volumes of images generated by fluorescence microscopy
- Utilize time-correlated single photon counting (TCSPC) to characterize the sub-Poissonian emission of organic quantum dots dispersed in a thin film of poly-methyl methacrylate (PMMA)
- Design and utilize a 3-color imaging protocol to perform single-molecule imaging of mRNA transcripts in human epithelial kidney and osteosarcoma cells

TEACHING EXPERIENCE

Tutor 2018-2019
Indiana University - Purdue University, Indianapolis, IN

- Tutored undergraduate students in introductory physics courses covering classical mechanics, classical electromagnetism, circuit analysis, and modern physics

AWARDS

NIH Graduate Training Fellowship 2020
University of Chicago, Chicago, IL

Travel Award and Lightning Talk Invitation 2019
Physical Sciences in Oncology - Minneapolis, MN

Hudson and Holland Scholarship for Diversity and Inclusion 2013-2017
Indiana University, Bloomington, IN

Founders Scholar 2013-2017
Indiana University, Bloomington, IN

Cigital Scholarship 2016-2017
Indiana University, Bloomington, IN

PUBLICATIONS

Maelle Locatelli[†], Josh Lawrimore[†], Hua Lin[†], Sarvath Sanaullah, **Clayton Seitz**, Dave Segall, Paul Kefer, Salvador Moreno Naike, Benton Lietz, Rebecca Anderson, Julia Holmes, Chongli Yuan, George Holzwarth, Bloom Kerry, Jing Liu, Keith D Bonin, Pierre-Alexandre Vidi. *DNA damage reduces heterogeneity and coherence of chromatin motions.* PNAS 12 July 2022; 119 (29): 1-11

Mengdi Zhang, **Clayton Seitz**, Garrick Chang, Fadil Iqbal, Hua Lin, and Jing Liu *A guide for single-particle chromatin tracking in live cell nuclei.* Cell Biology International 15 January 2022; 46 (5): 683-700

Wenting Wu, Farooq Syed, Edward Simpson, Chih-Chun Lee, Jing Liu, Garrick Chang, Chuanpeng Dong, **Clayton Seitz**, Decio L. Eizirik, Raghavendra G. Mirmira, Yunlong Liu, Carmella Evans-Molina; *Impact of Proinflammatory Cytokines on Alternative Splicing Patterns in Human Islets.* Diabetes 25 October 2021; 71 (1): 116–127

Clayton Seitz, Hua Lin, Keith Bonin, Pierre-Alexandre Vidi, and Jing Liu. *Quantifying the spatiotemporal dynamics of dUTP labeled chromatin during the DNA damage response.* Biophysical Society Annual Conference 2020

Clayton Seitz, Hua Lin, Keith Bonin, Pierre-Alexandre Vidi, and Jing Liu. *Quantifying the spatiotemporal dynamics of dUTP labeled chromatin during the DNA damage response.* Physical Sciences in Oncology Annual Conference 2019

Clayton Seitz, Andrew Reeser, Fangjia Li, and Jing Liu. *Machine learning methods in image based transcriptomics at single molecule resolution.* Biophysical Society Annual Conference 2019

PROFESSIONAL MEMBERSHIPS

- Biophysical Society
- American Society for Cell Biology

TECHNICAL SKILLS

Programming Languages & Software: Python, R, PyTorch, C, Git, LaTeX, Bash