



Cornell University

Postdoctoral Position in Short-Pulse Fiber Lasers

*Wise Research Group
School of Applied and Engineering Physics
Cornell University, Ithaca, NY*

What we do

We investigate a variety of nonlinear phenomena in single-mode and multimode optical fibers. The work is partially motivated by the need for better sources of ultrashort light pulses for applications. We are a theoretically-inclined experimental group; all members of the group do calculations (often numerical simulations) and experiments. A number of concepts developed in the group have led to commercial products, with lasers based on our work in numerous labs around the world. For more information visit our website, <https://wise.research.engineering.cornell.edu>.

Position

We are looking for a highly-motivated and independent person to work on new approaches to short-pulse generation in single-mode and multimode fiber. The work can range from scientific exploration of new nonlinear-wave phenomena to development of practical femtosecond lasers for applications such as nonlinear microscopy. The position will be available in late 2023.

Interested candidates should send their CV including publications and the contact information of two references to Prof. Frank Wise (frank.wise@cornell.edu).

Qualifications

- PhD in physics, applied physics, optics, or electrical engineering
- Strong experimental skills
- Experience with ultrashort light pulses is desirable but not required
- Good programming skills (Matlab, Python, Labview)
- Strong writing and communication skills

Examples of relevant prior work

1. Z. Liu, Z. M. Ziegler, L. G. Wright, and F. W. Wise, "Megawatt peak power from a Mamyshev oscillator," *Optica* **4**, 649 (2017).
2. L. G. Wright, D. N. Christodoulides, and F. W. Wise, "Spatiotemporal mode-locking in multimode fiber lasers," *Science* **358**, 94 (2017).
3. P. Sidorenko, W. Fu, and F. W. Wise, "Nonlinear ultrafast fiber amplifiers beyond the gain-narrowing limit," *Optica* **6**, 1328 (2019).
4. L. G. Wright *et al.*, "Mechanisms of spatiotemporal mode-locking," *Nature Phys.* **16**, 565 (2020).
5. Y.-H. Chen, P. Sidorenko, E. Antonio-Lopez, R. Amezcua-Correa, and F. Wise, "Efficient soliton self-frequency shift in hydrogen-filled hollow-core fiber," *Opt. Lett.* **47**, 285 (2022).

6. H. Pourbeyram, P. Sidorenko, F. Wu, L. Wright, D. Christodoulides, and F. Wise, “Direct observations of thermalization to a Rayleigh-Jeans distribution in multimode optical fiber,” *Nature Phys.* **18**, 685 (2022).
7. H. Haig, N. Bender, Y.-H. Chen, A. Dhar, N. Choudhury, R. Sen, D. Christodoulides, F. Wise, “Gain-induced Kerr beam cleaning in a femtosecond fiber amplifier,” *J. Opt. Soc. Am B: Opt. Phys* **40**, 1510 (2023).