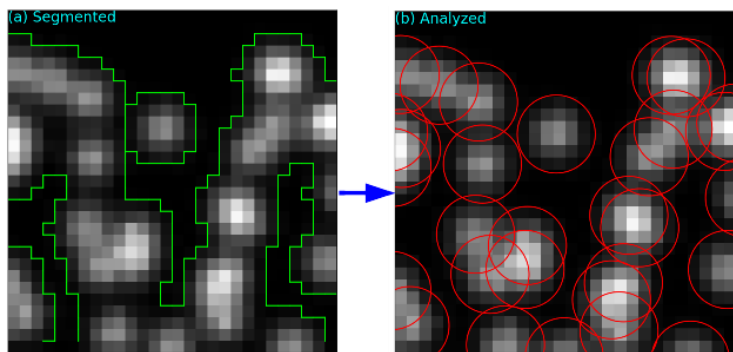


Superresolution Microscopy: What is it, how far can it go, and why did your college physics professor mislead you?

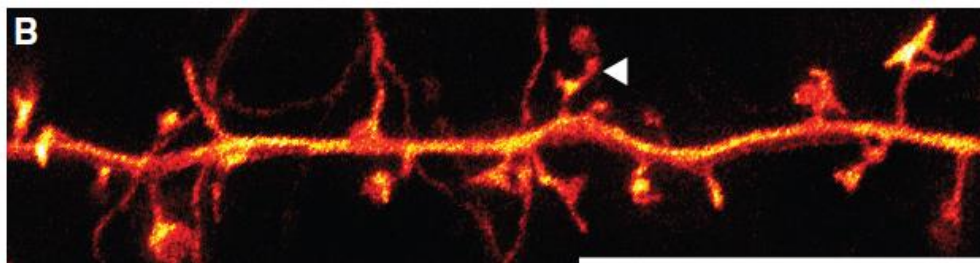
Alex Small, PhD

Associate Professor of Physics, California State Polytechnic University, Pomona



Most of us heard in college that because of the diffraction limit it is impossible for an optical instrument to image structural details smaller than the wavelength of light. However, the 21st century has seen astounding advances in superresolution fluorescence microscopy techniques. While there are several different approaches to the concept of superresolution, what they all share in common is an ability to exert molecular-scale control over the state of a fluorescent molecule. Consequently, while the lenses and cameras continue to form diffraction-limited focal spots, by combining

information on how the state of the molecule was controlled with clever image processing algorithms, we can image cells down to the single-molecule scale, enabling imaging that was considered impossible in the not-too-distant past. Some of the most exciting applications of this work are in the biomedical sciences, but the basic principles are all about physics and statistics, not biology, and can be applied to a wide variety of imaging situations. In this presentation I will explain the principles underlying the various superresolution techniques, and also the fundamental limits that have replaced Abbe's diffraction limit.



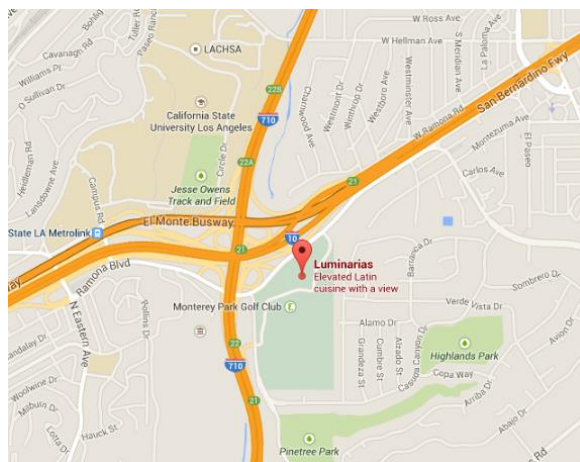
(Image from Berning et. al., Science, 2012)

About our speaker: Dr. Alex Small is an Associate Professor of Physics at California State Polytechnic University in Pomona. He teaches physics classes at all levels and in a wide variety of subfields (including optics and computational physics), and when he isn't teaching, grading, or doing committee work he tries to squeeze in a bit of research on biomedical applications of optics. He has an active collaboration with cancer researchers at City of Hope research hospital. Prior to starting at Cal Poly Pomona in 2007 he was a postdoctoral researcher at the National Institutes of Health in Bethesda, MD. He got his PhD in physics from UC Santa Barbara, with a thesis on light scattering in materials with wavelength-scale structure, and he got his BS in physics from USC. Alex has served on the Board of the OSSC since 2011, as Programs Chair, Secretary, Vice President, President, and now immediate Past President (2016-2017).

Wednesday, June 14, 2017
Reception: 6:00; Dinner: 7:00;
Annual Business Meeting & Talk: 8:00
Cost: \$35. After June 12 - \$45
OSSC Student Members: \$10, \$20 after June 12

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3500 Ramona Boulevard, Monterey Park, CA
On-line Registration: www.osscc.org or
Contact: Nicholas Croglia, Events@osscc.org,
(818) 331-4541



Please post this notice and invite your friends & colleagues to attend!