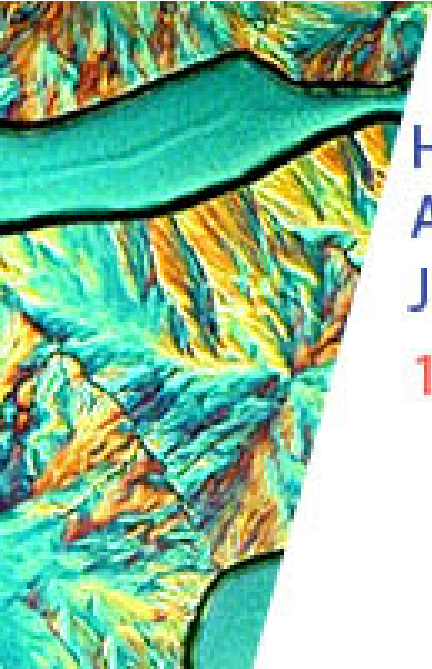


# The OSA Optical Materials Technical Group Welcomes You!



HOW TO USE BLENDER TO CREATE  
ATTRACTIVE SCIENTIFIC FIGURES AND  
JOURNAL COVER ART

10 July 2019 • 13:00 EDT

**OSA** Optical  
Material Studies  
Technical Group

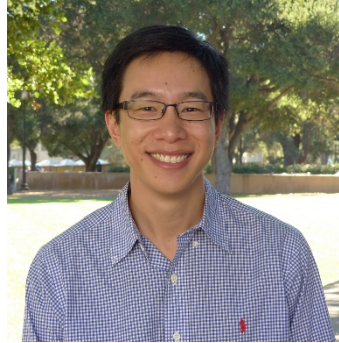
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**OSA** Optical  
Material Studies  
Technical Group

# Technical Group Leadership 2019



Chair  
**Guru Naik**  
Rice University, USA



Event Co-officer  
**Jonathan Fan**  
Stanford University, USA



Event Co-officer  
**Nate Kinsey**  
Virginia Commonwealth University, USA



Webinar officer  
**Francesco Monticone**  
Cornell University, USA



Social media officer  
**Howard Lee**  
Baylor University, USA

# Technical Group at a Glance

- Focus

- “Nano-optical Materials”
- **1650+** members!

- Mission

- To benefit YOU
- Webinars, e-Presence, publications, technical events, business events, outreach
- Interested in presenting your research? Have ideas for TG events? Contact us at [guru@rice.edu](mailto:guru@rice.edu).

- Find us here

- Website: [www.osa.org/OpticalMaterialStudiesTG](http://www.osa.org/OpticalMaterialStudiesTG)
- Facebook: [www.facebook.com/opticalmaterial/](http://www.facebook.com/opticalmaterial/)
- LinkedIn: [www.linkedin.com/groups/8272077](http://www.linkedin.com/groups/8272077)

# Today's Webinar: How to Use Blender to Create Attractive Scientific Figures and Journal Cover Art



**Dr. Nathaniel Kinsey**

Assistant Professor

***Virginia Commonwealth University***

## **Dr. Kinsey's Short Bio:**

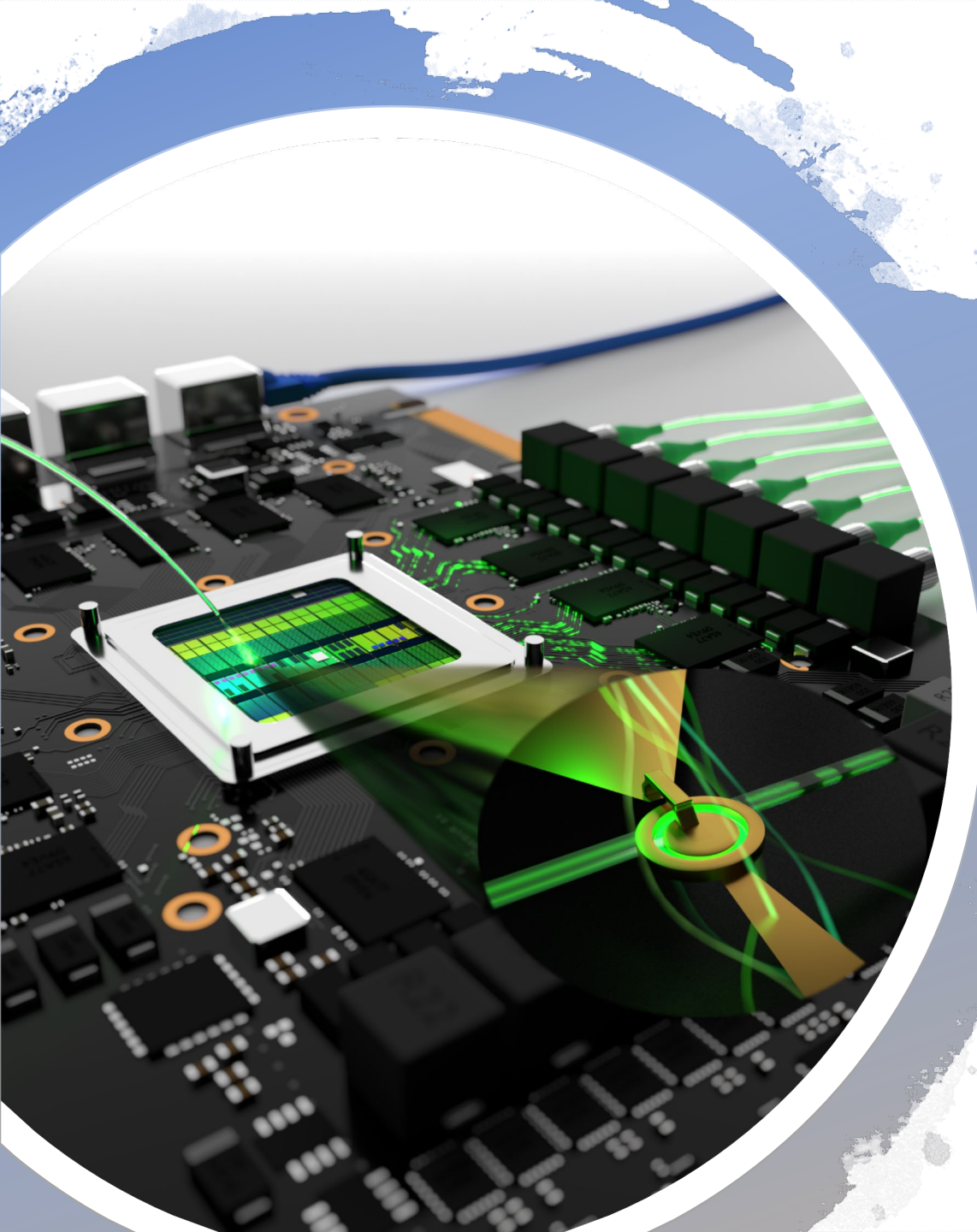
BS in Electrical Engineering – University of Missouri, 2011 (Magna Cum Laude)

MS in Electrical Engineering – University of Missouri, 2012

PhD in Electrical & Computer Engineering – Purdue University, 2016

Research interests: Nanophotonics, nonlinear optics, and plasmonics while exploring their application and intersection with new areas of technology

Dr. Kinsey has received several awards for his research contributions including the Meissner Fellowship, the Bilsland Dissertation Fellowship, and the College of Engineering Outstanding Graduate Research Award.



# Finishing Touches:

A tutorial in Blender for scientific art

Nathaniel Kinsey

Virginia Commonwealth University



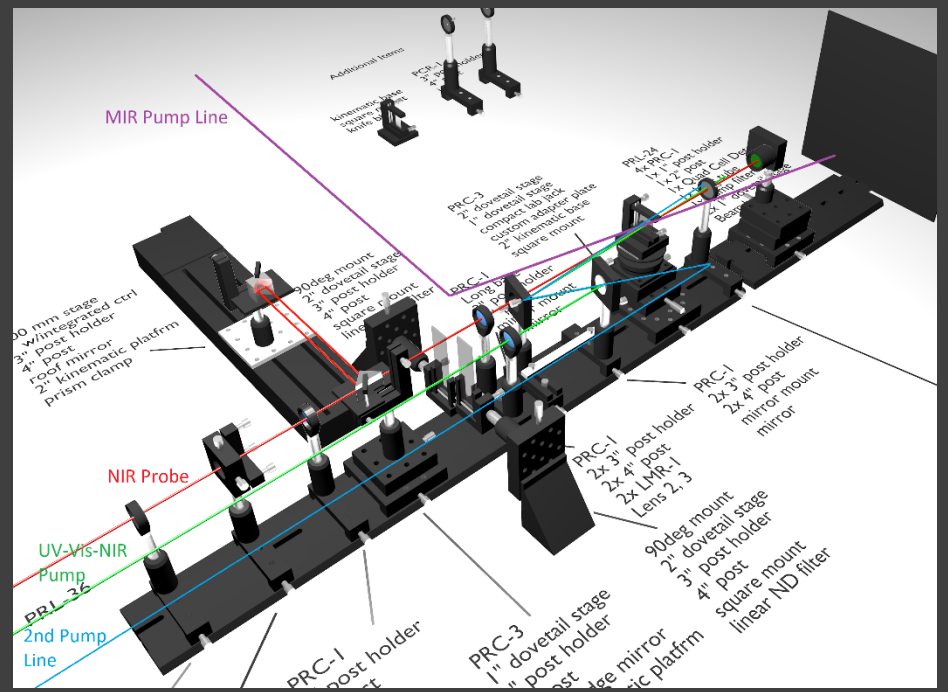
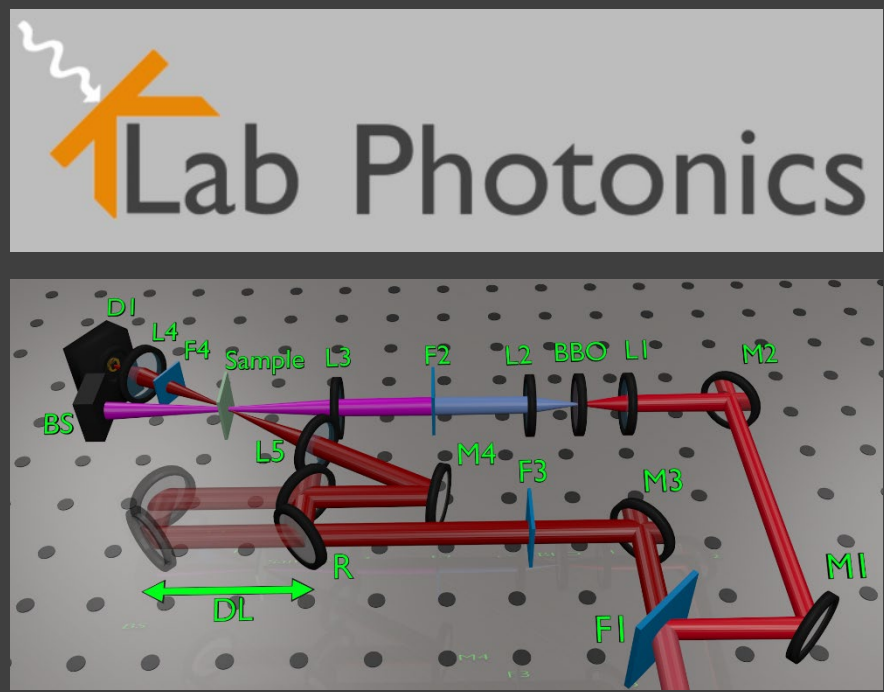
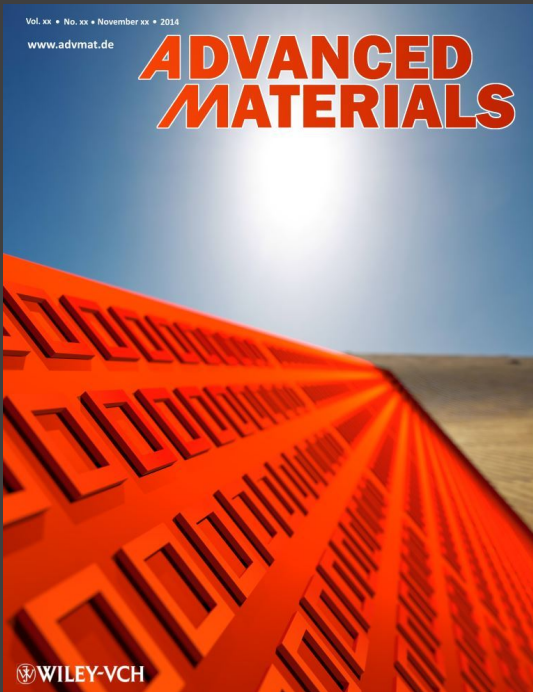
## What is Blender?

- <https://www.blender.org/>
- An exceptionally powerful opensource 3-D rendering platform
- It is much more powerful than we will utilize
  - Check out some of the movies people have made!

## Why is Blender?

- Its free!
- Its powerful
- It has a wide and interactive user base





## What can you do with Blender?

- Compete for journal cover art
- Create attractive experimental diagrams for papers
- Create logos and themes for presentations
- Plan experimental setups
- Use the creative side of your brain!

## Why does it matter?

- Attractive figures and cover art can lead to extra attention to your papers
- Create unified themes for group/lab webpages and presentations
- Optimize experimental construction/budgeting and plan custom parts

# Blender Basics

- So, now that your convinced, lets dive in!
- First, lets talk about navigation and controls:

## Navigation:

Rotation	<i>Middle mouse button &amp; move</i>
Up/Down/Left/Right	<i>Shift + middle mouse</i>
Zoom	<i>Scroll wheel</i>
Select/De-select	<i>Right click on/away from object</i>
Multi-select	<i>Shift + right click</i>
Select/De-select all	<i>a</i>

## Object Manipulation:

Translating	<i>g + x,y,z to fix global axis or + xx, yy, zz for local</i>
Rotating	<i>r + x,y,z to fix global axis or + xx, yy, zz for local</i>
Scaling	<i>s + x,y,z to fix global axis or + xx, yy, zz for local</i>



# Blender Basics

- Now lets talk about the Blender Modes

## Object Mode:

Select and manipulate entire mesh objects (cubes, torus, etc.)

## Edit Mode:

Modify the vertices, lines, faces of a selected object

- Move between modes using *TAB*

# Blender's Rendering Modes

## Blender Internal Engine:

A more simplistic line-of-sight rendering engine which is fast but not realistic

- Good for logos, or “flat” image where shadows and complex lighting effects are not desired (e.g. not photo real)
- No longer actively supported although still included
- We will not discuss today. Sometimes its useful, but cycles is becoming more user friendly and is the primary engine.

## Cycles Render Engine

Full ray-tracing engine with global illumination and physics driven optics calculations (yes there's optics here too!)

- Use this engine for projects where you desire photo realism
- Blender supports multi-core and GPU accelerated rendering. USE IT!
- Pick one or the other for your project as some settings (such as materials) do not transfer easily between the Engines

