vibrationally excited

less

more
Summer 2023 – May 30 to Aug 4
Ed Hilinski and Bridget DePrince
Department of Chemistry and Biochemistry
Florida State University
Tallahassee, Florida 32306-4390
# A Chronology

**First Day – May 30, 2023**

**Welcome!**

<table>
<thead>
<tr>
<th>REU Participant</th>
<th>Home Institution</th>
<th>In-Lab Mentor</th>
<th>Faculty Advisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Josh Birke</td>
<td>Southeast Missouri State U.</td>
<td>Colette Sullivan &amp; Rachel Weiss Clark</td>
<td>Lea Nienhaus</td>
</tr>
<tr>
<td>Christopher Cornejo</td>
<td>Elmhurst University</td>
<td>Brandon Nusser</td>
<td>Lei Zhu</td>
</tr>
<tr>
<td>Annaliese Franklin</td>
<td>Bridgewater College</td>
<td>Tunde Shonde &amp; Oluwadara Olasupo</td>
<td>Biwu Ma</td>
</tr>
<tr>
<td>Daniel Larsen</td>
<td>Ithaca College</td>
<td>Zana Zana Singleton</td>
<td>Justin Kennemur</td>
</tr>
<tr>
<td>Diana K. Nazario Torres</td>
<td>Pontifical Catholic U., Puerto Rico</td>
<td>Shubham Bisht &amp; Dibya Mondal</td>
<td>Michael Shatruk</td>
</tr>
<tr>
<td>Makaya Robinson</td>
<td>Saint Mary's College</td>
<td>Nikolas Dos Santos &amp; Antony Sekar Kuldandai Raj</td>
<td>Igor Alabugin</td>
</tr>
<tr>
<td>Isabel Sedwick</td>
<td>Loyola University Maryland</td>
<td>Sumesh Babu Krishnan</td>
<td>Jack Saltiel</td>
</tr>
<tr>
<td>Dominic Willadsen</td>
<td>Concordia U. Wisconsin</td>
<td>Erica Knorr</td>
<td>Kenneth Hanson</td>
</tr>
</tbody>
</table>
First Week Agenda

Tuesday, May 30, 2023

8:00-8:30 a.m. Walk to DLC from McCollum Hall – Dr. Bridget DePrince
8:30-9:20 a.m. Breakfast / Mingling – DLC 123
  Introduction to the Department – DLC 123
  Dept. Chair Drs. Geoff Strouse & Ed Hilinski
9:20-10:00 a.m. Ice Breaker: Participants and Faculty Advisors Introductions
10:00-11:00 a.m. Meet the In-Lab Mentors – Lab Tours
11:00-12:00 noon Departmental Paperwork & HR
12:00-1:00 p.m. Group Lunch – REU Participants & guests
  – Kearney Osceola Grille
1:30-2:30 p.m. Safety Training –
  Ben Arline, Environ. Health & Safety – DLC 123
2:30-4:00 p.m. Departmental Paperwork & FSU ID –
  Dr. Ed Hilinski – DLC 123 & FSU Card Center
First Week Agenda (continued)

Wednesday, May 31, 2023
-3:30 p.m.  Work in the Research Labs
3:30-4:30 p.m.  Departmental Ice Cream Social – CSL Lobby

Thursday, June 1, 2023
Work in the Research Labs

Friday, June 2, 2023
-3:30 p.m.  Work in the Research Labs
3:30-5:00 p.m.  REU Weekly Seminar – Dr. Ed Hilinski
   Entry Surveys, Baseline Quiz, summary of the first week
   Research ethics, lab culture, lab notebooks, expectations
   Research resources, tutorials, learning beyond lab,
   Scifinder Scholar, NMR training, ChemDraw, other software

Saturday, June 3, 2023
12:00 p.m.  River Boat Ride, Swimming, and Dining at Wakulla Springs, FL
            – Dr. Ed Hilinski
### Weeks 2 - 10

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Location, time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T June 6</td>
<td>Photochemistry Café – Dr. Biwu Ma – w/breakfast</td>
<td>DLC 123, 9:00 a.m.</td>
</tr>
<tr>
<td>R June 8</td>
<td>Tour of the Maglab at 10:00 a.m.</td>
<td>Tallahassee, FL</td>
</tr>
<tr>
<td>F June 9</td>
<td>Photochemistry Café – Dr. Jack Saltiel</td>
<td></td>
</tr>
<tr>
<td>Sa June 10</td>
<td>REU Seminar - Ed Hilinski - discussion of research presentations</td>
<td></td>
</tr>
<tr>
<td><strong>Week 3</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T June 13</td>
<td>Photochemistry Café – Dr. Ken Hanson – w/breakfast - Graduate School Demystified</td>
<td>DLC 123, 9:00 a.m.</td>
</tr>
<tr>
<td>F June 16</td>
<td>REU Seminar (discussion of student research themes)</td>
<td>DLC 123, 3:30 p.m.</td>
</tr>
<tr>
<td><strong>Week 4</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T June 20</td>
<td>Photochemistry Café – Dr. Igor Alabugin– w/breakfast</td>
<td>DLC 123, 9:00 a.m.</td>
</tr>
<tr>
<td>R June 22</td>
<td>Tour of Nammo Perry Inc (depart at 7:30 am for tour at 9 am)</td>
<td>Perry, FL</td>
</tr>
<tr>
<td>F June 23</td>
<td>REU Seminar (3-min student presentations: research themes)</td>
<td>DLC 123 3:30 p.m.</td>
</tr>
<tr>
<td><strong>Week 5</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T June 27</td>
<td>Photochemistry Café – Dr. Lea Nienhaus – w/breakfast</td>
<td>DLC 123 9:00 a.m.</td>
</tr>
<tr>
<td>F June 30</td>
<td>REU Seminar (student presentations: research themes)</td>
<td>DLC 123 3:30 p.m.</td>
</tr>
<tr>
<td>Sa July 1</td>
<td>Coffee &amp; Tea Conversations – Dr. Ed Hilinski</td>
<td>10:00 a.m.</td>
</tr>
<tr>
<td><strong>Week 6</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T July 4</td>
<td>Independence Day picnic</td>
<td>DePrince Residence</td>
</tr>
<tr>
<td>F July 7</td>
<td>Photochemistry Café – Dr. Justin Kennemur</td>
<td>DLC 123, 3:30 p.m.</td>
</tr>
<tr>
<td><strong>Week 7</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T July 11</td>
<td>Photochemistry Café – Dr. Mike Shatruk – w/breakfast</td>
<td>DLC 123 9:00 a.m.</td>
</tr>
<tr>
<td>R July 13</td>
<td>Tyndall Air Force Base (depart 8 am EDT for at 10 am CDT tour)</td>
<td>Tyndall, FL</td>
</tr>
<tr>
<td>F July 14</td>
<td>REU Seminar – Dr. Ed Hilinski – weekly review and update</td>
<td>DLC 123 3:30 p.m.</td>
</tr>
<tr>
<td>Sa July 15</td>
<td>Coffee &amp; Tea Conversations – Drs. Ed Hilinski &amp; ???</td>
<td>10:30 a.m.</td>
</tr>
</tbody>
</table>

**Underlined events are to be confirmed.**
### Weeks 2 – 10 (continued)

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Location, time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Week 8</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T July 18</td>
<td>Photochemistry Café – Dr. Ken Hanson -- w/breakfast</td>
<td>DLC 123 9:00 a.m.</td>
</tr>
<tr>
<td>F July 21</td>
<td>REU seminar (student 15-min research presentations)</td>
<td>DLC 123, 3:30 p.m.</td>
</tr>
<tr>
<td></td>
<td>1. Daniel Larsen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Annaliese Franklin</td>
<td></td>
</tr>
<tr>
<td>Sa July 22</td>
<td>Coffee &amp; Tea Conversations – Drs. Ed Hilinski &amp; ???</td>
<td>10:30 a.m.</td>
</tr>
<tr>
<td><strong>Week 9</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M July 24</td>
<td>Dinner with REU Students, In-Lab Mentors &amp; Faculty</td>
<td>Kool Beanz, 6:00 p.m.</td>
</tr>
<tr>
<td>T July 25</td>
<td>Photochemistry Café – Dr. Lei Zhu – w/breakfast</td>
<td>DLC 123, 9:00 a.m.</td>
</tr>
<tr>
<td>R July 27</td>
<td>REU seminar (student 15-min research presentations)</td>
<td>DLC 123, 3:30 p.m.</td>
</tr>
<tr>
<td></td>
<td>3. Christopher Cornejo</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Dominic Willadsen</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Makaya Robinson</td>
<td></td>
</tr>
<tr>
<td>F July 28</td>
<td>REU seminar (student 15-min research presentations)</td>
<td>DLC 123, 3:30 p.m.</td>
</tr>
<tr>
<td></td>
<td>6. Isabel Sedwick</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Diana Nazario Torres</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Joshua Birke</td>
<td></td>
</tr>
<tr>
<td>Sa July 29</td>
<td>Coffee &amp; Tea Conversations – Drs. Ed Hilinski &amp; ???</td>
<td>10:30 a.m.</td>
</tr>
<tr>
<td><strong>Week 10</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T Aug 1</td>
<td>Photochemistry Café – Dr. Ed Hilinski – w/breakfast</td>
<td>DLC 123, 9:00 a.m.</td>
</tr>
<tr>
<td>R Aug 3</td>
<td>Poster Session (student research presentations)</td>
<td>CSL lobby, 3:00 p.m.</td>
</tr>
<tr>
<td>F Aug 4</td>
<td>Exit interviews and surveys</td>
<td>DLC 5th Floor Conf. Rm.</td>
</tr>
<tr>
<td>F Aug 4</td>
<td>REU seminar</td>
<td>DLC 123, 3:30 p.m.</td>
</tr>
<tr>
<td></td>
<td>First Friday Festivities</td>
<td>6:30 p.m.</td>
</tr>
<tr>
<td>SaSu Aug 5-6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Underlined events are to be confirmed.**
REU In-Lab Mentors Meeting
May 24, 2023 in Chemical Sciences Laboratory (CSL) Room 1005
with Drs. Bridget DePrince and Ed Hilinski

left to right: Oluwadara Olasupo; Tunde Shonde; Zana Zana Singleton
Nikolas Dos Santos; Sumesh Babu Krishnan; Brandon Nusser;
Erica Knorr; Rachel Weiss Clark; Colette Sullivan; Sarah Bennett;
Bridget DePrince
The REU participants have some morning beverages
May 29, 2023 at Black Dog Café, Tallahassee, Florida with Dr. Ed. Hilinski

clockwise from 8 o’clock: Isabel Sedwick; Diana K. Nazario Torres; Annaliese Franklin; Makaya Robinson; Dominic Willadsen; Daniel Larsen; Josh Birke; Christopher Cornejo
The REU Participants have some lunch
May 29, 2023 at Midtown Caboose, Tallahassee, Florida with Dr. Ed Hilinski

left to right: Dominic Willadsen; Christopher Cornejo; Daniel Larsen; Josh Birke; Makaya Robinson; Isabel Sedwick; Diana K. Nazario Torres; Annaliese Franklin
... and some dinner
May 29, 2023 at Mayuri Indian Restaurant, Tallahassee, Florida with Dr. Ed Hilinski

left to right: Annaliese Franklin; Isabel Sedwick; Dominic Willadsen; Josh Birke; Daniel Larsen; Christopher Cornejo; Makaya Robinson; Diana K. Nazario Torres
Ice Cream Social
May 31, 2023 in CSL Lobby
Experiments Are Underway
June 1, 2023

Josh Birke and in-lab mentor Colette Sullivan doing optical alignments in the Nienhaus Laser Lab

Isabel Sedwick performing a light-sensitive column chromatography in the Saltiel Lab
REU Weekly Seminar
June 2, 2023, 3:30 – 5:00 p.m. with Dr. Ed Hilinski

Entry survey, entry quiz, summary of the first week
Research ethics, lab culture, lab notebooks, expectations
Research resources, tutorials, learning beyond lab,
SciFinder Scholar, NMR training, ChemDraw, other software

Clockwise from 8 to 4 o’clock

Josh Birke
Daniel Larsen
Annaliese Franklin
Diana K. Nazario Torres
Makaya Robinson
Isabel Sedwick
Dominic Willadsen
Chris Cornejo
Trip to Wakulla Springs

June 3, 2023
Wakulla, Florida
with Ed Hilinski

www.floridastateparks.org/parks-and-trails/edward-ball-wakulla-springs-state-park
Photochemistry Café

“Low Dimensional Metal Halide Perovskites and Hybrids: From Synthetic Control to Device Integration”

http://www.chem.fsu.edu/reu-links/

Prof. Biwu Ma

June 6, 2023, 9:00-10:00 a.m.
DLC 123, Tallahassee, Florida
Photochemistry Café
“Low Dimensional Metal Halide Perovskites and Hybrids: From Synthetic Control to Device Integration”
http://www.chem.fsu.edu/reu-links/
Prof. Biwu Ma
June 6, 2023, 9:00-10:00 a.m.
DLC 123, Tallahassee, Florida

Click here to watch the video.
Tour of the National High Magnetic Field Laboratory

nationalmaglab.org/

June 8, 2023, 10:00-11:00 a.m., Innovation Park, Tallahassee, Florida

Depart from 1st Floor DLC Lobby at 9:30 a.m.
Lunch – Renegade Grille at Seminole Legacy Golf Club

https://www.seminolelegacygolfclub.com/
June 8, 2023, 11:30 a.m., 2550 Pottsdamer Street, Tallahassee, Florida
Photochemistry Café
“Elementary Photophysical Transitions and Photochemical Reactions”
http://www.chem.fsu.edu/reu-links/
Prof. Jack Saltiel
June 9, 2019, 3:30-4:30 p.m.
DLC 123, Tallahassee, Florida

1,3-Diene Triplets: Conformer Specific Photoisomerization and Photodimerization
Fluorenone sensitized photoisomerization

\[
\begin{align*}
S_0 \quad &\overset{57 \text{ kcal/mol}}{\xrightarrow{K}} \quad s-t,^t &\quad \overset{52 \text{ kcal/mol}}{\xrightarrow{K'}} \quad s-c,^t \\
S_0 \quad &\overset{59 \text{ kcal/mol}}{\xrightarrow{K'}} \quad s-t,^c &\quad \overset{\text{Not present}}{\xrightarrow{K}} \quad s-c,^c \\
\end{align*}
\]

\[
\begin{align*}
K' \quad &\overset{0.31}{\xrightarrow{ \text{D} \quad 0.31tt \quad + \quad 0.50ct \quad + \quad 0.19cc} } \\
K' \quad &\overset{0.69}{\xrightarrow{ \text{D} \quad 0.70tt \quad + \quad 0.30ct} } \\
\end{align*}
\]
Photochemistry Café
“Elementary Photophysical Transitions and Photochemical Reactions”
http://www.chem.fsu.edu/reu-links/
Prof. Jack Saltiel
June 9, 2023, 3:30-4:30 p.m.
DLC 123, Tallahassee, Florida
REU Weekly Seminar

June 9, 2023, 4:30 p.m. with Dr. Ed Hilinski

Survey about the first two weeks,
Discussion about activities of the preceding week and research
research resources - https://guides.lib.fsu.edu/c.php?g=352310&p=2380486
tutorials, learning beyond lab - http://www.chem.fsu.edu/reu-links/
SciFinder Scholar – first time users need to register - https://guides.lib.fsu.edu/c.php?g=352310&p=2380486
NMR training, ChemDraw and Chem3D, other software
Photochemistry Café
“Graduate School Demystified”

http://www.chem.fsu.edu/reu-links/

Prof. Ken Hanson
June 13, 2023, 9:00-10:00 a.m.
DLC 123, Tallahassee, Florida
REU Weekly Seminar
June 16, 2023, 3:30 p.m. with Dr. Ed Hilinski

Discussion about activities of the preceding week and research
Discussion about comments given on the June 7 survey
Board talks about research:
Chris Cornejo; Daniel Larsen; Isabel Sedwick; Makaya Robinson