Agenda for OSIRIS Users and Developers Workshop

Monday, September 18

8:30-9:00  Breakfast

9:00-9:10  Welcome by Warren Mori

Introduction to OSIRIS 4.0

9:10-10:00  Object-Oriented Structure and How To Be A Developer
            Ricardo Fonseca and Adam Tableman

10:00-10:10  Break

10:10-11:00  Case Study – Implementing the PGC
             Ricardo Fonseca and Anton Helm

11:00-11:10  Break

11:10-12:00  New Hardware Support: AVX2, AVX-512 (KNL), and GPU
             Ricardo Fonseca and Adam Tableman

12:00-12:15  Collisions
             Joshua May

12:15-1:30  Lunch &
12:45-1:15  Lunchtime tutorial on Accessing OSIRIS and using OSIRIS through GitHub (led by Anton Helm)

New features in OSIRIS 4.0

1:30-1:50  Ponderomotive Guiding Center: PGC
           Anton Helm

1:50-2:10  Quasi 3D including field ionization
           Asher Davidson and Thamine Dalichaouch

2:10-2:40  QED
           Thomas Grismayer

2:40-3:00  Break & Poster Viewing

3:00-3:30  Customized FD and Hybrid FFT/FD Algorithms for eliminating the NCI
           Xinlu Xu

3:30-4:00  New Antennas for modeling the nonlinear optics of plasmas & Non-uniform particle weighting
           Han Wen
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00-4:10</td>
<td>Break &amp; Poster Viewing</td>
</tr>
</tbody>
</table>
| 4:10-4:20| Diagnostic for azimuthal harmonic expansion  
*Thamine Dalichaouch* |
| 4:20-4:30| Beam field initialization  
*Ricardo Fonseca*       |
| 4:30-5:00| Open discussion on how to become a developer of OSIRIS
*Led by Ricardo Fonseca* |

**Tuesday, September 19**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-9:00</td>
<td>Breakfast</td>
</tr>
</tbody>
</table>
| 9:00-9:15| Short talks on usage of OSIRIS 3.0 or 4.0, with audience feedback & discussion
| 9:00-9:15| Modeling LWFA: Downramp injection  
*Xinlu Xu*     |
| 9:15-9:30| Modeling LWFA with the quasi-3D version  
*Asher Davidson* |
| 9:30-9:45| Modeling PWFA  
*Weiming An* |
| 9:45-10:00| OSIRIS usage at DESY: full start-to-end PWFA simulations for FLASHForward
*Jens Osterhoff* |
| 10:00-10:15| Break                                                                 |
| 10:15-10:30| Particle In Cell Compton Scattering  
*Fabrizio Del Gaudio* |
| 10:30-10:45| Coupling of Numerical PIC and Monte Carlo  
*Paulo Alves* |
| 10:45-11:00| Numerical challenges in efficient modeling of colliding flows  
*Scott Feister* |
| 11:00-11:15| Modeling Nonlinear Optics of Plasmas (ICF related laser-plasma interactions)  
*Frank Tsung* |
| 11:15-11:30| Break                                                                 |
| 11:30-11:45| Modeling collisionless shocks and overdense laser-plasma interactions  
*Frederico Fiuza* |
11:45-12:00  Modeling ionization injection  
Xinlu Xu

12:00-1:30  Lunch &  
12:45-1:15  Lunchtime status report on Documentation and the Wiki Page (led by Anton Helm)

Current development and discussion of ideas for future plans

1:30-1:45  Dynamic Load Balancing  
Ricardo Fonseca

1:45-2:15  Overview of PICKSC Science Gateway  
Qiyang Hu and Frank Tsung

2:15-2:30  Break

2:30-2:45  Integrating UPIC Algorithms into OSIRIS  
Michael Touati

2:45-3:00  Boris correction: Exact and approximate  
Kyle Miller

3:00-3:15  Research at FEMTO-ST Institute  
Francois Courvoisier

3:15-3:30  Break

3:30-3:45  Modified spherical coordinates system for PIC simulations of pulsar magnetospheres  
Fábio Cruz

3:45-4:00  Multi-dimensional shearing modules in OSIRIS 4.0  
Giannandrea Inchingolo

4:00-4:15  QED energy and relativistic temperature diagnostics  
Kevin Schoeffler

4:15-5:00  Discussion on Directions for Future Development: Wish List

Wednesday, September 20

8:30-9:00  Breakfast

Discussions on Best Practices, Test Problems, Example Problems, and Gateway Usage

9:00-9:30  Discussion on Simulating High-Energy Density Physics  
Moderated by Frank Tsung and Han Wen
9:30-10:00  Discussion on Simulating Plasma-Based Accelerators  
_Moderated by Warren Mori and Xinlu Xu_

10:00-10:15  Break

10:15-11:00  Discussion on Simulating Collisional Processes  
_Moderated by Frederico Fiuza and Archis Joglekar_

11:00-11:30  Discussion on Simulating Ultra High Intensity Lasers  
_Moderated by Thomas Grismayer and Michael Touati_

11:30-12:00  Discussion on the Science Gateway and Educational Software  
_Moderated by Frank Tsung, Warren Mori, and Ricardo Fonseca_

  Preview of Educational Test Problems  
_Kyle Miller and Lance Hildebrand_

12:00-1:30  Lunch &  
_Lunchtime Feedback on Needs and Outcomes (moderated by Warren Mori and Ricardo Fonseca)_

2:00-5:00  Informal working discussions

**Thursday, September 21**

9:00-12:00  More informal working discussions if there is interest