Tentative Schedule of Group Collaborative Coding (GCC) Sessions

We will meet in SCIW 124 at 3:15 pm unless stated otherwise

1. Week 1 (9/22/2017):
   1. Preliminaries (introduction to git, terminal, text editors, compilers)
   2. Write code to compute properties of Surface Plasmon Polaritons, including:
      1. Wavelength
      2. Propagation length
      3. Momentum
      4. Energy
   3. To-do at home: Compute these properties for the following materials:
      1. Silver/Air vs Silver/Glass
      2. Aluminum/Air vs Aluminum/Glass
      3. Gold/Air vs Aluminum/Glass
      4. Borophene-x/Air vs Borophene-x/Glass
      5. Borophene-y/Air vs Borophene-y/Glass

Relevant Background Information on Surface Plasmon Polaritons (SPPs) can be found here: <https://github.com/jayfoleyiv/ISPP/tree/master/PAPERS>

1. Week 2 (9/29/2017)
   1. Review of results from Week 1
   2. Preliminaries (introduction to Snell’s Law and Complex Snell’s Law)
   3. Write code to compute properties of Inhomogeneous Surface Plasmon Polaritons, including:
      1. Wavelength
      2. Propagation length
      3. Momentum
      4. Energy
      5. Confinement length
   4. To-do at home: Compute the above properties for ISPPs on surfaces with the following interfaces (Air above in all cases):
      1. Silver/gold
      2. Gold/silver
      3. Gold/Borophene-x
      4. Gold/Borophene-y
      5. Silver/Borophene-x
      6. Silver/Borophene-y
      7. Borophene-x/Borophene-y
      8. Borophene-y/Borophene-x

Relevant Background Information on ISPPs and Complex Snell’s Law can be found here: <https://github.com/jayfoleyiv/ISPP/tree/master/PAPERS>

1. Week 3 (10/06/2017)
   1. Review of results from Week 2
   2. Preliminaries (introduction to Permittivity models: Drude+Lorentz models, Effective Medium Models)
   3. Write code to compute permittivity from Drude + Lorentz model
   4. Write code to compute permittivity of the following “alloys” within the Maxwell-Garnett effective medium model
   5. To-do at home:
      1. Compute permittivity of the following materials with a given Drude+Lorentz model and compare to experimentally-determined values:
         1. Silver
         2. Gold
         3. Tungsten
         4. Aluminum
      2. Compute permittivity of the following composites (with volume fractions 40%-60% in all cases) within the Maxwell-Garnett effective medium model
         1. Silver-water
         2. Silver-glass
         3. Gold-water
         4. Gold-glass
         5. Silver-gold
         6. Gold-silver

Relevant Background Information can be found in the book “Absorption and Scattering of Light by Small Particles” by Craig Bohren and Donald Huffman (available at Cheng Library).

1. Week 4 (10/13/2017)
   1. Review of results from Week 3
   2. Application of Effective Medium Approximation to anisotropic permittivity (specifically, Borophene)
   3. Adapt Week 2 and 3 code to approximate anisotropic permittivity of Borophene as an effective medium (incident angle is related to volume fraction)
   4. To-Do at home: Compute the following properties of ISPPs on Borophene across a range of angles with respect to the x-y plane:
      1. Wavelength
      2. Propagation length
      3. Momentum
      4. Energy
      5. Confinement length