

**ISR SUMMER SCHOOL**  
21-27 July 2018  
University of Massachusetts, Lowell/MIT Haystack Observatory

**Saturday - WESTFORD**

- Summer school staff will be at the hotel to answer questions
- Dinner vouchers available for participants, as arrivals are staggered

**Sunday - MIT Haystack Observatory**

- 07:30 *Breakfast*
- 08:00 Drive to MIT Haystack Observatory
- 08:30 Welcome (*Phil Erickson*)  
Introduction of participants and instructors (*Elizabeth Kendall*)  
Addressing computer needs and other logistics (*Bill Rideout*)  
Group assignments (*Elizabeth Kendall*)
- 09:30 Introduction to the Ionosphere (*Elizabeth Kendall*)
- 10:15 *Break*
- 10:30 ISR as a Black Box (*Bill Rideout*)
- 11:15 Radar 1: Radar Physics (*Anthea Coster*)
- 12:00 *Lunch (pizza at Millstone)*
- 13:00 ISR Theory 1: The Short Introduction to Incoherent Scatter Theory (*Anthea Coster*)
- 14:15 Ionosphere - radar data example delivery (*Millstone Science Staff*)
- 14:30 *Break*
- 14:45 Group 1&2: MIT Haystack/Millstone Hill Tour  
Group 3&4: Madrigal database and group work (*Bill Rideout*)
- 16:00 Group 1&2: Madrigal database and group work (*Bill Rideout*)  
Group 3&4: MIT Haystack/Millstone Hill Tour
- 17:15 Drive to BBQ dinner
- 17:30 *Dinner (BBQ at Anthea's house)*
- 19:30 Drive to UMass Lowell Inn and Conference Center

**Monday - UML (Wannalancit Mill, 600 Suffolk)**

- 07:30 *Breakfast*
- 08:30 Ionosphere - radar data example discussion (*Millstone Science Staff*)
- 08:45 Radar 2a: Radar Signal Processing (*Josh Semeter*)
- 09:30 Radar 2b: Radar Signal Processing Problem Sets (*Josh Semeter*)
- 10:15 *Break*
- 10:45 Radar 3: Statistical Signal Processing (*Roger Varney*)
- 11:30 The Millstone Hill Geospace Facility (*Phil Erickson*)
- 12:00 *Lunch*
- 13:00 Millstone experiment design and data analysis (*Phil Erickson and Bill Rideout*)
- 13:45 Support from non-Millstone ISRs during experiment (*Ashton Reimer*)
- 14:00 Experiment Design (group work)
- 15:00 *Break*
- 15:30 Experiment Design (group work continued)
- 18:00 Deadline to submit group experiments
- 18:30 *Dinner on own*
- 19:00 Experiment Slot #1
- 21:00 Experiment Slot #2
- 23:00 Experiment Slot #3

**Tuesday - (Wannalancit Mill, 600 Suffolk)**

- 04:00 Experiment Slot #4
- 06:00 Experiment Slot #5

07:30 *Breakfast*  
09:15 Lowell Excursion (meet at the Lowell Nat'l Park Visitor Center, 246 Market St.)  
12:00 *Lunch*  
13:00 ISR Theory 2 (*Phil Erickson*)  
13:45 The NSF Upper Atmosphere Facilities Program (*Carrie Black*)  
14:15 ISR Theory 3 (*Phil Erickson*)  
15:00 *Break*  
15:15 Retrieve radar data and start to work on group assignments  
19:00 *Dinner on own*  
20:00 Elective at Lowell Inn and Conference Center (*Phil Erickson*)

### **Wednesday - (Wannalancit Mill, 600 Suffolk)**

07:30 *Breakfast*  
08:30 Data Analysis and Fitting 1 (*Ashton Reimer and Roger Varney*)  
10:00 *Break*  
10:15 Data Analysis and Fitting 2 (*John Swoboda and Ryan Volz*)  
11:30 Millstone Science (*Phil Erickson*)  
12:00 *Lunch*  
13:00 Work on presentations (coffee available for *break*)  
19:00 *Dinner on own* (*Note: Lecturers meet for dinner discussion*)

### **Thursday - (Wannalancit Mill, 600 Suffolk)**

07:30 *Breakfast*  
08:30 Question and answer session  
10:00 *Break*  
10:30 Lowell Center for Space Science and Technology (*Supriya Chakrabarti*)  
11:00 Digisonde Science (*Ivan Galkin*)  
11:30 Phased arrays (*Roger Varney*)  
12:15 *Lunch*  
13:15 Work on presentations (coffee available for *break*)  
19:00 *Dinner on own* (*Note: Lecturers meet for dinner discussion*)

### **Friday - (Wannalancit Mill, 600 Suffolk)**

07:30 *Breakfast*  
08:30 Student presentations (2x30 min)  
09:30 *Break*  
09:45 Student presentations (2x30 min)  
10:45 Conclusions, Evaluations, and Closing Discussions  
11:30 *Lunch and Depart for Airport*