



## **NASA All Stars Mentor Program Syllabus – June 2012**

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**Meeting location Astronomy & Astrophysics Center, The University of Chicago  
Room 41 and other locations, TBD**

**Program website/blog:** <http://julia.cuipblogs.net/>

Course Description: This course intends to increase teachers' knowledge and understanding of multiwavelength astronomy (MWA) and its connection to other scientific disciplines (i.e., physics and chemistry) through engaging in activities that will 1) introduce teachers to NASA MWA resources and effective pedagogies for teaching in this area; 2) demonstrate authentic research activities as they are undertaken by professional astronomers and citizen scientists alike; and 3) prepare participants with in-depth content knowledge and the skills for engaging in astronomical inquiry. The course intends to develop teachers to become NASA ALL STARS mentors by involving them in the design of a professional development program that they will deliver to teacher/student teams in two summers and made available online in various media formats.

### **SUMMER PROGRAM SCHEDULE**

**Monday, June 18, 1:00-4:00 p.m. / Orientation**

**Monday, June 25, 12:00-1:00 p.m. / Welcome to NASA's Multiwavelength Universe! - Real-Time Web Conference Session #1**

Instructors and participants will meet via teleconference supplemented with WebEx web conferencing to:

- discuss course objectives
- explore our virtual learning environment (Moodle + WebEx)
- share instructor and participant backgrounds
- review participation and credit requirements

**June 25 –June 28 / The Electromagnetic Spectrum: Individual Exploration and Reflection.  
Starting June 28, Exploring What Our Students Think - On-Line Discussion**

Instructors and participants will use articles and data to identify and discuss common student misconceptions and explore methods to elicit them.

**Monday, July 2, 10:00-11:30 a.m. / Classroom Activity: What's Getting Through? Exploring Light Sources and Detectors -Real-Time Web Conference Session #2**

Instructors and participants will meet via teleconference supplemented with WebEx web conferencing to explore how different energies of light can be transmitted, detected and blocked.

**Starting Monday, July 2 / How NASA Missions Use the Electromagnetic Spectrum to Understand Our Universe: Individual Exploration and Reflection**

**Starting Thursday, July 5 / Bringing NASA into Your Classroom: Resources for You and Your Students: Individual Exploration and Reflection**

**Monday, July 9, 12:00-2:00 p.m. / Observing with NASA: MicroObservatory Online Telescope Tutorial - Real-Time Web Conference Session #3**

Instructors and participants will meet via teleconference supplemented with WebEx web conferencing to learn how to acquire and analyze visible light images using the MicroObservatory Telescope.

**Friday, July 13, 12:00-1:00 p.m. / Putting It All Together- Real-Time Web Conference Session #4**

Instructors and participants will meet via teleconference supplemented with WebEx web conferencing to discuss their experiences in the course, complete evaluations and resolve outstanding issues.

**Monday, July 16 – 20, 9:30 a.m.-4:30 p.m. / Workshop at The University of Chicago**

Lectures by content area experts and tool demonstrations.

**July 31, August 2, August 3 – F2F meeting to be scheduled**

**Starting Monday, August 6 through Friday, August 10 / Development of individual lesson plans**

**Tuesday-Thursday, August 14-16 / Final Projects: Lesson Plan/Activity Demonstrations and Critiques**

## **ACADEMIC YEAR PROGRAM**

**Schedule:** Dates for F2F meetings will be scheduled via Doodle poll. Meetings will be held on Saturdays. Each meeting is expected to last 4 hours.

**Blogging:** As you implement your lesson, blog! The objectives of the blog are to identify problems, share techniques, and help the mentors prepare and document real-world application of their summer training to inform the Year 2 NASA All-Stars pilot program. One mentor will serve as the moderator and will receive a “bonus” for this effort.

**Quarterly Meetings:** There will be 3 meetings during the academic year when we will continually take up the matter of analyzing the gap in instructional preparation and content-area readiness and recommend a solution through designing the NASA All-Stars professional development program. A key goal of the quarterly meetings is to enhance and enlarge the syllabus with on-the-ground wisdom on how to best communicate this content to their peers, as well as students, and recommend support structures for teachers to facilitate implementing the multiwavelength astronomy resources in the classroom. The framework for the Year 2 program is to offer:

- In-depth exploration of content with the goal of improving and deepening teachers’ content knowledge;
- Learner-centered;
- Longer duration (summer institute model of 90-120 hours);
- Active learning opportunities, including mentoring, teamwork, observation, reflection, and assessment;
- Coherence with teacher’s experiences and encouraging ongoing communications among teachers as they build new experiences;
- Collective participation among peers, leading to a shared professional culture/network.

Additionally, as new MWA content is rolled out, it will be presented at the quarterly meetings.

### **Key activities of quarterly meeting:**

Winter meeting – set dates for summer program, begin recruitment

Spring meeting – finalize and revise program, fix schedules, plan summer institute (to be delivered to peers in large and small group, learner-centered activities).

## **EXPECTATIONS FOR ASSIGNMENTS/PARTICIPATION**

- You are expected to participate in the online course and its discussions.
- You are expected to attend F2F meetings and participate in discussions.
- You are expected to participate in the All Stars blog.
- You are expected to read and reflect on (through blogging) reading assignments.
- You are expected to develop a lesson plan for integrating the GR lesson during the school year that will include the following features:
  - 1) identify student pre-requisites for the resources and activities
  - 2) establish a timeline for integration
  - 3) include clearly-stated teaching objectives for using these resources and connections to existing resources/curricula
  - 4) anticipate what supports are needed to accomplish the implementation (scheduling computer lab time, e.g)
  - 5) identify 1-3 demonstrations/astronomical inquiry activities to be used with the lesson
  - 6) identify 3 types of assessments that can be done
  - 7) identify appropriate NSES standard(s)/project 2061, next gen standards
- You are expected to demonstrate your final project to the group and participate in discussions.

## **RESOURCES AND READINGS**

Throughout the course, we will read articles and review NASA education content related to our work, as well as the results of our teacher focus group and student survey on MWA. We will frequently consult *Astronomy Education Review* for current scholarship on astronomy education (<http://aer.aas.org/>). Each teacher will also receive a copy of *The Telescope: Its History, Technology, and Future*, by Geoff Andersen.