



## **Concordia Workshop on Student Research and Robotic Telescopes**

Tuesday and Wednesday, June 9 and 10, 2015, Liberal Arts 123  
Concordia University, 1530 W. Concordia Ave, Irvine, CA 92612

Co-Chairs

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In 2006, Cuesta College launched an astronomy research seminar that featured original, published research conducted by student teams. Over the years, this seminar and its derivatives, such as summer camps at the University of Oregon's Pine Mountain Observatory, have produced some three dozen published papers with well over one hundred student coauthors. Many of the students have been high school advanced-placement students taking the research seminar after school as their first college course.

Until recently, just a few student teams took the Astronomy Research Seminar through Cuesta College (ASTR 299). The students, primarily high school Advanced Placement students, met in person with the instructor, Russ Genet, at a single school, Arroyo Grande High School. For the spring semester of 2015, teams from 10 different schools have been met in-person locally with volunteer seminar facilitators, and also met all together in online GoToMeeting conferences that included presentations of each team's research proposal and final research results. This "hybrid" in-person/online seminar has garnered the attention of the National Science Foundation, the Department of Education, and the Council on Undergraduate Research as an economical way to provide high school and undergraduate students a genuine, published, scientific research experience. The hybrid version of this astronomy research seminar will be offered this coming fall by both Cuesta College and Concordia University. Proposals to the Department of Education and the National Science Foundation are being prepared for further expansion of the seminar.

The seminar's student observations have increasingly been made with remote, robotic telescopes. All observations need to be promptly completed near the beginning of the seminar, as

students need most of the seminar's time to analyze their data, write (and rewrite and externally review) their papers, and prepare and give their final presentations. While poor local weather or equipment difficulties often make timely in-person, at-the-telescope, student observations problematic, remote, robotic observatories provide observations in an expeditious, efficient, and fail-safe manner. It should be noted that such remote observations are now the norm for professional astronomers.



*Networks of telescopes can be accessed remotely by students to gather their data at the beginning of a semester. Left is Rich Williams with one of the Sierra Stars Observatory Network telescopes. Center is iTelescope's facility in Australia; note the PlaneWave Instruments' CDK-700 telescope with the white-colored mount in the center of the building. Right is the 2-meter Faulks Telescope North on the summit of Haleakala, one of many telescopes of the Las Cumbres Observatory Global Telescope Network.*

### **Workshop Accommodations**

There is no registration fee for the workshop. Just let the co-chairs know that you are coming and the number in your party.

Low cost dorm suites are available for workshop participants at Concordia University, Irvine. The cost for the dorm rooms is only \$30/person/night, but it is a bare bones deal. You bring your own sheets, blankets, pillows, and towels. If someone is flying or training in, John Kenney, our local host, can set you up with these, but those who are driving should throw these items in the back of their car. The dorm suites have two bedrooms, each with two single-person beds, two dressers, and two desks, a common room with a refrigerator, microwave, large table and chairs, and a bathroom with a single shower and two sinks. WiFi is available in each suite. To reserve your dorm room, email or contact co-chair and local host John Kenney at [john.kenney@cui.edu](mailto:john.kenney@cui.edu), (949) 214-3298.

For off-campus accommodations there are two hotel/motel recommendations in Irvine, CA near to Concordia that cover 99% of John's official hotel business at Concordia. One is Wyndam Hotel, the hotel Concordia uses for its VIP guests, 17941 Von Karman Ave, Irvine, CA 92614, 949-863-1999. The other is Motel 6, Orange County Airport #1256, that John uses all the time for his extended stay guests and research collaborators on a tight budget at 1717 East Dyer Road, Santa Ana, CA 92705, 949-261-1515.

The food at the Concordia University Cafeteria is excellent and all-you-can-eat, and is \$7.00/person/meal. For the Monday and Wednesday evening dinners, we will be eating at the Luca Café (see below).

## Agenda

### Monday, June 8

1:00-5:00 PM Check into dorms, informal discussions Liberal Arts Room 123

6:00-9:00 PM Drinks and dinner at the Lucca Café, 6507 Quail Hill Parkway, Quail Hill Shopping Center, Irvine, CA 92603, Phone: (949) 725-1773



*The Luca Cafe*

### Day One: Student Research

**Tuesday, June 9** Liberal Arts Room 123

7:00-8:00 Breakfast at the Concordia Cafeteria

8:00-9:00 Informal conversations

#### **9:00-10:00 Session I: Research Seminar Overviews**

John Kenney Welcome to Concordia University

Russ Genet Overview of the Astronomy Research Seminar

Jo Johnson The Astronomy Research Seminar: Past and Future

10:00-10:30 Mid-morning break

#### **10:30-11:30 Session II: Technical Considerations**

Cheryl Genet Formatting and Publication of Papers

Rachel Freed InStAR Web Site

Mike Hoffert Astrometric Eyepiece Training Aid Demo

11:30-12:00 Group photographs

12:00-1:00 Lunch Concordia cafeteria

#### **Afternoon: Working Sessions**

#### **1:00-2:30 Session III: Research Seminars**

Lessons Learned So Far

Fall Cuesta College Astronomy Research Seminar

Cuesta College Second Semester Advanced Seminar (leadership)

Fall Concordia University Astronomy Research Laboratory

2:30-3:00 Mid-afternoon break

#### **3:00-4:30 Session IV: Pedagogies and Proposals**

Pedagogies, such as experiential learning, team-based learning, etc.

Department of Education Proposal

National Science Foundation Proposal

5:30-6:30 Dinner Concordia cafeteria

## **Day Two: Robotic Telescopes**

**Wednesday, June 10** Liberal Arts Room 123

7:00-8:00 Breakfast at the Concordia Cafeteria

8:00-9:00 Informal conversations

### **9:00-10:00 Session V: Historical Settings**

Russ Genet The Early Days of Robotic Telescopes and Observatories

Bob Denney The Incredible Journey from Manual to Autonomous/Remote

10:00-10:30 Mid-morning break

### **10:30-11:30 Session VI: Facilities and Telescopes**

Rich Williams Why Remote Astronomy Facilities are a Game Changer

Dave Rowe The PlaneWave Instruments CDK-1000

11:30-12:00 Group photographs

12:00-1:00 Lunch Concordia cafeteria

### **Afternoon Presentations**

#### **1:00-2:30 Session VII: Additional Topics**

Paul Hardersen The Joys, Pains, and Frustrations of Operating a University Observatory

Tom Smith Robotic Observatories Food for Thought

2:30-3:00 Mid-afternoon break

### **Afternoon Working Session**

#### **3:00-4:30 Session VIII: Enhancing Student Research on Robotic Telescopes**

6:00-9:00 PM, Drinks and dinner at the Lucca Café, 6507 Quail Hill Parkway, Quail Hill Shopping Center, Irvine, CA 92603, Phone: (949) 725-1773

## **Society for Astronomical Sciences Annual Symposium**

The Concordia Workshop will be immediately followed, June 11-13, by the Society for Astronomical Sciences' annual symposium in nearby Ontario with workshops on the 11<sup>th</sup> on (a) spectroscopy and (b) speckle interferometry of close doubles stars, and then presentations on the 12<sup>th</sup> and 13<sup>th</sup> devoted to scientific research with small telescopes.

### **The Lucca Cafe**

Lucca's menu is based on the use of healthy and high quality ingredients, such as certified Angus beef, free-range turkey, hormone-free chicken, wild salmon and locally grown organic produce. The bar features a unique wine list with more than 30 wines by the glass, with a choice of a 2.5-ounce or 6-ounce pour of wine, encouraging guests to be adventurous with their selections.

Executive Chef Cathy Pavlos is the driving force behind this most unique and dynamic eatery. Having grown up in a typical close-knit large Italian family, most of her childhood memories of family have to do with cooking with her grandmother for Sunday family gatherings. Though educated as an architect and an art historian, and despite more than 20 years in architectural practice and as a college professor, Cathy has always been drawn back to cooking. Having traveled to Italy every year for the past 30 years, Cathy has been developing a collection of remarkable recipes, inspired by her grandmother's cooking and her favorite restaurants in Italy, France, and Greece. These recipes, seen on LUCCA's menu, have been slightly modified to

build in the flavors of California with its emphasis on the use of healthy and high quality ingredients, such as certified Angus beef, free-range turkey, hormone-free chicken, wild salmon, and locally grown organic produce.