



ORBS: Opportunities for Research in the Behavioral Sciences

James C. Nieh, UCSD; Minou Spradley, SDCC; Margie Stinson, SWC

<http://webct/webct/public/home.pl> UserID "niehguest1" and password "nguest"

I. OVERVIEW

The goal of our program is to provide research experience opportunities for undergraduate students from community colleges and to encourage these students to transition to four-year colleges and to pursue careers in the behavioral sciences. In particular, we would like to assist students who are interested in transferring to UCSD by familiarizing them with the campus, the faculty, and the educational and research opportunities available.

The Nieh lab is interested in the evolution of animal languages and approaches this question from several levels of analysis. Our primary goal is to understand how and why location-communication systems have evolved in the highly social bees.

Students register for ORBS through the ORBS website (<http://webct/webct/public/home.pl> UserID "niehguest1" and password "nguest", click on ORBS icon). Students at San Diego City College and Southwestern Community College may contact Minou Spradley (mdspradl@sdccd.cc.ca.us) who is the **primary ORBS coordinator** for both colleges. Southwestern Community College students may also contact Margie Stinson (mstinson@swc.cc.ca.us). Minou Spradley and Margie Stinson are familiar with the various software packages used by the ORBS program, including WebCT.

II. ORBS & STUDENT TEACHING

A distinctive feature of the ORBS program is the model of student teaching and learning through teaching. You will share your techniques and reciprocally teach and learn from other students. ORBS students will therefore work in pairs with an ORBS student mentor who has had at least one quarter of experience in the lab. Initially, ORBS mentors will be UCSD students who have already worked in the lab, but as the program progresses, experienced ORBS students will also become mentors. Because teaching is one of the best ways to learn, you will also develop at least one written or video protocol to be placed on the e-lab to help train others in the method of data analysis that you have developed. In the second quarter, you will help a new ORBS student. You will always be able to contact the professor directly for help, but we would also like you to turn to the designated student experts in order to enrich their learning experience and yours.

Language is important issue for some ORBS students and we have therefore identified ORBS student mentors who are fluent in Spanish in order to provide additional guidance. Other languages will be added as the ORBS program progresses.

II. GENERAL COURSE REQUIREMENTS

A. STUDENT RESPONSIBILITIES

Through your research in the lab, you will be given the opportunity to fully engage in the scientific process. I am committed to helping you succeed in this endeavor, but in order for you to succeed, you need to commit to the following:

1. Time commitment: 6 hours per week (minimum). Animals usually do not behave on demand, and thus you may find yourself extremely busy when experiments are working well. To work most efficiently, you should take advantage of such times to obtain as much data as possible. Keep in mind that although it works today, it may not work tomorrow!

2. Lab meetings: (one meeting each two weeks). Attendance at lab meetings is required.

3. Readings: Based upon your individual project, you will be given a reading list. Some readings may be discussed at a lab meeting, but an understanding of all required readings will be necessary for the final paper. All readings will be available online on the Nieh e-lab. During the course, you will also be required to conduct a literature search and submit two new papers (not previously listed in the e-lab readings) for inclusion in our online library. Please email me a brief description of why these papers are relevant and enclose either the pdf files of the papers or place a paper copy in my mailbox.

4. WebCT workshop: During the first week, there will be a WebCT workshop that you are required to attend (if you have not previously used the designer functions of WebCT) in order to learn how to use WebCT, a primary tool of the lab. Throughout the course, you will need to use WebCT. You will be given a WebCT homepage that you will design and maintain. This webpage will contain: (1) your project statement describing the broader significance of your project and the purpose of your project, (2) a project plan that lists the relevant dates on which certain parts of the project will be completed, (3) your final project paper, and (4) a streaming video file of your PowerPoint presentation. **IMPORTANT:** With the exception of (1), all other items on your webpage should be "hidden". They will be available to all lab members, but will not be visible to lab guests. Once the data is published, these hidden items will be released to the general public. Our web address is: <http://webct.ucsd.edu>

5. Laboratory notebook: Learning and practicing good lab notebook habits is an important part of your experience. You will be asked to keep a well-organized lab notebook that documents what you are doing at each step of the project. This is particularly important because a great deal of effort, time, and money is being expended to collect and analyze this data. When in doubt, write it down. These

notebooks will remain with the lab and should be sufficiently clear to allow another student working on the project or myself to understand what you have done and what should be done next. *General lab notebook guidelines apply.* All notes should be written in non-erasable ink. All notes and numbers should be clearly legible. Data or material that is incorrect should be crossed out but left such that the original is still legible. Also, an explanation should be appended to clarify what the error was. At the end of each page, sign on the bottom of the page. **Your notebook should never leave the lab.**

6. Data organization: You will be given a project binder containing a plastic envelope in which you can store all of the summary data CD's and DVD's pertinent to your project. If your project has extensive video data, this will be stored in your own project box. The binder should be logically divided into several sections corresponding to your project. The first section is reserved for your final paper. Subsequent sections should contain relevant papers, figures, tables, processed data (divided as appropriate), and raw data. **Your data binder should never leave the lab.**

7. Computer usage: Computers are used as available. No computers are exclusively used with any given project. Some computers are newer and more powerful than others. Priority on using these more powerful computers is given to students who are conducting extensive video analysis. If someone comes and needs to use your computer, please try to accommodate him or her. If you are having difficulties using the computers, please first ask the students around you. If they cannot help, please consult the binder entitled "Computer Bible". This has a great deal of useful information dealing specifically with our lab. Much of this information is also available online through the WebCT discussion page. If none of these resources solves your problem, please come talk to me.

8. Firewire drives. All of your files will be saved on a firewire drive. Generally, you will share your firewire drive with other projects, but we will try to arrange it so that there is minimal conflict in drive usage. Plug your drive into an available computer and work directly off the drive. Do not save files onto the computer hard drive or onto the desktop. Save everything onto the firewire drive. **Other users may accidentally erase files saved on the computers!** Periodically, all of the files will be erased to clean the computers. **Your firewire drive should never leave the lab.**

9. Data backup: Data backup is essential because *all of your hard work can disappear with a single keystroke.* Save your data onto your firewire drive and burn a CD or DVD copy of all of the analyzed data (Excel, JMP, Videopoint, Illustrator, Word, etc. files) at least once a month (to be stored in your binder). Once a month, use Zipit software to compress all of your analyzed data into file that you upload onto your WebCT folder (example: "Nieh042268.zip" is a backup made on April 22, 1968).

10. Written report: At the end of the quarter, you will submit a brief written report about your research. This report should include a summary of your work, written as a scientific paper (introduction, materials & methods, results, discussion and

references), with figures and tables to summarize your work. The written part of the paper (not including figures and tables) should not exceed 5 pages.

11. PowerPoint presentation: At the end of the quarter, you will also give a 15 min PowerPoint presentation of your results. Generally, this should contain no more than a few data slides and should not contain more than 15 slides. To facilitate discussion, end your PowerPoint presentation with at least two general questions about the broader significance of your work and about the “next step”, where your research should logically take you. Lab members will write a 5 min paragraph answering these questions and summarize what they understood from your talk.

12. Teaching: Because teaching is one of the best ways to learn, you will also share your techniques and reciprocally teach and learn from other students. Your interaction with other lab members will be one of your most important learning experiences.

B. FACULTY RESPONSIBILITIES

I am committed to helping you succeed in the lab. I define success as (1) having completed the requirements of the course, (2) learning the details of your research question, (3) learning how to think critically about your research and that of other students, and (4) extending the results of your research to the next logical step. Not all projects will obtain the results they originally envisioned. This is part of the scientific process. It is important to understand why your results do not match your expectations and to determine how to proceed next.

- 1. Time.** I will work with you on your project for at least 2 hours per week.
- 2. Project planning.** I will help you select a project and monitor the progress of the project on a weekly basis. We will jointly decide upon changes in the project schedule.
- 3. Training.** I will initially train you and then assign a graduate student or experienced lab member to assist in supplemental training in procedures and methods.
- 4. Availability.** I am generally available in my office throughout the week. Please feel free to knock on my door whenever you have any questions. If I am busy, I will schedule a time for us to meet.
- 5. Paper & presentation.** I will carefully and critically review your paper and presentation to ensure that you fully understand the relevant concepts involved and are able to clearly present your project and its results to others.

III. YOUR ROLE IN THE LAB

I believe that it is extremely valuable for your own training—whether in industry, science, and as intellectual development—to avail yourself of all the opportunities for interaction within and outside the lab. We have collaborators in Brazil and in Mexico and they are available through the Nieh e-lab for several levels of interaction ranging from

questions and chats to cooperative work in the field. In the Section of Ecology, Behavior, and Evolution, we have many faculty and student resources for you to pursue your interests and questions. Please take time to meet the other faculty and their students. Learn about their approaches and experiences!

IV. EARNING COURSE CREDIT

You will be able to enroll in a 290 course at your community college and thus receive credit for your work. The credit will be variable depending upon the weekly time commitment. If you wish to receive course credit from UCSD and are not a UCSD student, it may be possible to arrange course credit as a one-quarter opportunity for a nominal fee. This credit may be transferred should the student transfer to UCSD.

V. ANIMAL BEHAVIOR & COMMUNICATION: BIEB 166

BIEB 166 is an upper division course for UCSD students who have had some background in evolutionary biology. BIEB 166 covers classical concepts of Ethology as well as Neuroethology, behavioral endocrinology, and neurobiology. The first half of the course focuses on behavior and roughly follows Alcock's *Animal Behavior*. The second half of the course has a strong biophysical emphasis and follows Bradbury and Vehrencamp's *Principles of Animal Communication*. The course has a website: <http://webct/webct/public/home.pl> (use UserID "student166a" and password "student166a"). All lecture slides, lecture notes, lecture movies, exams, problem sets, and most readings are available through this website. Generally, Juniors and Seniors enroll in BIEB 166, although Freshmen have also successfully taken the course. It is possible for non-UCSD students to enroll in BIEB 166 for a nominal charge for one quarter of credit that will apply, should they transfer to UCSD in the future.

VI. YOUR ROLE IN THE LAB

We believe that it is extremely valuable for your own training—whether in industry, science, or simply as an intellectual exercise—to avail yourself of all the opportunities for interaction within and outside the lab. We have collaborators in Brazil and in Mexico and they are available through the Nieh e-lab for several levels of interaction ranging from questions and chats to cooperative work in the field. In the Section of Ecology, Behavior, and Evolution, we have many faculty and student resources for you to pursue your interests and questions. Please take time to meet the other faculty and their students. Learn about their approaches and experiences!

VII. FIELD WORK

When you first enter the lab, your project will largely focus on data analysis in order for you to learn the necessary analysis tools. During this period, you may also be asked to help with experiments. Based upon your initial work and interest, you may be asked to take part in designing and executing experiments after your first quarter. During or after

this second quarter, you may want to think about a more independent project, perhaps one that takes you off-campus.

VIII. ANIMAL BEHAVIOR SOCIETY CONFERENCE

Pending the availability of funding and on your research performance, you may be eligible to travel to the Animal Behavior Society Conference to present your results in a poster. This is a great opportunity for you to meet other students and scientists, particularly if you are interested in pursuing graduate school. The ORBS program will cover travel costs, lodging, and conference fees for three students if the necessary funding can be obtained.

IX. MY LAB VISION

This section is last, in a position of prominence. The lab has many components, but of all of these, the people are the most important. You can think about our lab as a small enterprise, like a business, whose assets are ideas and people and whose products are education and research—knowledge and papers. Because science cannot occur in isolation, your interactions with other people in the lab are critical to the success of our enterprise. In achieving your own goals of engaging in the scientific method and learning about animal communication, you will be most successful if help others achieve the same goals. Learn to teach and teach to learn. This is why the lab is organized into groups of people who work on similar projects and why teaching is an explicit part of your responsibilities. Take the time to help your lab-mates and allow them to help you. My vision of the ideal lab is of a closely-knit group working towards the common goal of understanding more about animal communication—a lab in which all members share their ideas, knowledge, and efforts. I hope that you will help us achieve this vision.

STUDENT: I have read the ORBS guidelines and agree to the responsibilities listed in this document.

Signature: _____ Date: _____

P.I. (James Nieh): I have reviewed the ORBS guidelines with the student and agree to the responsibilities listed in this document.

Signature: _____ Date: _____