PLANETARY SCIENCE EDUCATION: THE SJI PROGRAM; B. H. Betts, A. Bormanis, R. Kenealy, and D. B. Nash, San Juan Capistrano Research Institute, 31872 Camino Capistrano, San Juan Capistrano, CA 92675, Email: educate@sgi.org.

SUMMARY. The San Juan Institute (SJI) has created a successful Planetary Science education program that continues to expand. The SJI education program currently has several active parts: (1) Planetary Science field trips, generally held at the Institute, which teach basic Planetary Science and expose over 3000 third to eighth grade students per year to a working scientific institution; (2) a constant flow of high school and college student science interns; (3) teacher workshops related to science conferences held at SJI; and (4) public lectures on topics in Planetary Science. SJI is currently working with several partners developing ways to more widely disseminate its current field trip programs, including: (1) real time interactive video feeds that will allow students at remote sites to view and participate in field trips held at SJI; (2) developing video tapes of the field trips; (3) and providing portions of the programs over local cable television. SJI also is working on expanding its field trips at the Institute by offering them on more days each week (current booking is two days per week) and by developing a field trip oriented towards advanced (AP and Gate) high school students. Other projects in development include teacher and student workshops, and hypertext field trips available over the World Wide Web (WWW). In addition to teaching a new generation about Planetary Science and exciting them about science in general, SJI hopes that its program will be of use to others in Planetary Science education as a model in whole or in part, and as an established location to implement newly developed education support materials.

CURRENT FIELD TRIP PROGRAM. As part of an ongoing Field Trip series entitled "A Planetary Journey Through the Solar System," groups of 60 to 100 elementary school (3rd-6th grade) students visit SJI for two hours of interactive lectures and demonstrations on the subject of planetary science. Over 3000 students attended SJI Field Trips during 1994, bringing the total number of students directly instructed by this program to over 8,000 in 3 years. By November 1994 the program was completely booked through June 1995 (at our current level of 2 field trips per week). The children come from all parts of Southern California and comprise a rich mixture of cultural backgrounds. In 1994 SJI added a second program for students in the 5th-8th grades, "Exploring Planets with the Electromagnetic Spectrum." The feedback we have received from students and teachers who have experienced these programs has been extensive and extremely positive. Some examples are shown in Fig. 1.

FIELD TRIP EXPANSIONS. SJI is currently developing several expansions to its field trip programs, including the development of a new program (SJI's third) on gravity's role in shaping the solar system which will be directed at high school students, thus expanding our program to encompass grades 3-12. We are also developing several methods of distributing our current field trips to wider audiences, including the following: (1) SJI is working with Pacific Bell of California to arrange a live video feed of its Field Trip program so that schools throughout California can view and participate in live SJI Field Trips without coming to the SJI facility. The high-speed interactive video link will allow students to not only see and hear the Field Trip demonstrations and lectures, but to actually participate by asking questions and receiving live answers from working scientists through the audio/video hook-up. (2) SJI is working to develop portions of the Field Trips as well as special Planetary Science education programming for local cable television broadcast. (3) SJI will also create educational video tape products based on the SJI Field Trips for classroom and home use. (4) SJI is working to develop software versions of its field trips that will include images and video clips. These electronic field trips will be available over the WWW via Mosaic software. The hypertext format employed by Mosaic will allow users to select portions of the Field Trip programs that interest them the most, skip over things they already know, and revisit the items that most intrigued them.

OTHER EDUCATIONAL PROGRAMS. SJI currently has several non-Field Trip education activities, and is developing others. Current and future programs include: (1) a high school and undergraduate student laboratory intern program; (2) a public lecture series highlighting current topics in Planetary Science (for example, 1994 included a Shoemaker-Levy impact lecture, and a review of lunar
science for the 25th anniversary of Apollo 11); (3) teacher workshops following science conferences held at SJI highlighting ways to teach K-12 students information related to the conference; (4) development of multi-day teacher and student workshops on Planetary Science that will include laboratory spectroscopy and image processing; and (5) museum-style exhibits at SJI open to the public, e.g. meteorites and occasional viewings of lunar samples.

Figure 1a. Portions of letters written by students who attended the SJI Planetary Journey field trip in October 1994 (with Beverley Leyman's class from R. H. Dana School).

Figure 1b. Examples of feedback from teachers to SJI obtained via evaluation forms given to every teacher who attends a field trip at SJI. The evaluation forms include a section for numerical evaluation of the field trip as well as for comments.

Figure 1c. Winning examples of student art work submitted in response to the SJI space art contest held during the SJI field trip breaks between lectures. The art contest allows us to increase the children's interest and excitement about space and the planets in a method independent of the lectures and demonstrations.