Project ASTRO - Tucson

Issue 14, May 2001

ASTROGRAM

Astronomers and Teachers as Partners for Learning

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Project ASTRO - Tucson Coalition Organizations

Flandrau Science Center
Kitt Peak National Observatory
Lunar & Planetary Laboratory
Mt. Graham Discovery Park
NOAO
Pima College
Pompea & Associates
Steward Observatory
Whipple Observatory
Tucson Amateur Astronomy Association
Tucson Unified School District
US Gemini Program

Larry Behers — Astronomer Partner Extraordinaire

As I get to know the partners involved in Project ASTRO-Tucson, I realize what extraordinary people who have graced our program. Every once in awhile, one member shines with such distinctive brightness that gives cause for recognition. I would like to take a moment to recognize the many accomplishments of Larry Behers.

Larry has been involved with Project ASTRO since the Fall of 1999. In the last year alone, he has made 50 visits to 10 classrooms. That is in addition to the half a dozen star parties he has done this year . . . ok, I will let you catch your breath . . . Larry spends most of his visits to grades 1-3 on behalf of Project ASTRO talking about the phases of the Moon, the reasons for seasons, the scale of the solar system, constellations, comets, and the Sun, stars and star legends. He also has some excellent 3-D images of the Universe, which adds that extra dimension of excitement and reality for children.

Besides taking so much time out from his job as President of both Nova West Communications and Nova West International Marketing to visit schools on behalf of Project ASTRO, he is an assistant scout master for Boy Scout troop #294. Larry is also a trustee for the corporation of Rainbow Girls in Tucson, which is an organization that does fundraising and charity work.

What is really striking to me is that in conjunction with his Project ASTRO visits, Larry also takes the time to answer a multitude of kids' questions on astronomy with full-blown, colored handouts individually tailored to each child. His actions reinforce their curiosity, confidence and motivation, which is exemplified by the ending to his letters to the children, "keep asking intelligent questions and always reach for the stars."

Preparing to look for sunspots at Copper Creek Elementary School.

Two of the many questions he has shown me are among his favorites and his answers give more insight into the heart and soul of Larry and his love for astronomy and kids than anything else. The first question asked, "When you were a little kid, what was your favorite planet?" His answer started out "When I was in the third grade, my Dad bought me a telescope; it was my own little window to the Universe and I imagined that the planets were beautiful jewels that I could hold in my hands. This first thing I ever saw through a telescope was the planet Saturn. I never imagined it could be as beautiful as it was . . . " The second question asked, "Do you have a buddy?" He answered, "My buddy is my best friend and business partner. We have been best buddies since we were eight years old. As children we used to lay under the beautiful summer star-filled sky in our backyard and talk about our dreams and plans for the future. We knew even then as children that someday we would be partners in business. Best friends can help you reach for the stars."

Larry gives full dimension to the meaning of philanthropist. Thank you, Larry, for all of your time and effort in Project ASTRO. We are all the better for it. As one of your own students wrote you, "Good friends are like stars. You don't always see them, but you know they are always there . . .'

There are many other Project ASTRO-Tucson astronomers and teachers who deserve special recognition – who would you like to see profiled next time? Contact Connie Walker at 520 318-8535 or e-mail at cwalker@noao.edu.

Project ASTRO -Tucson Goes To Site Leaders Meeting

All eleven official Project ASTRO sites are linked through a National Network of site leaders which meets annually and keeps in touch by telephone and e-mail throughout the year. The main objective of the National Network is to foster communication among the sites and with the science education community, and to mentor new sites as they join. Good ideas originating at one ASTRO site are quickly shared among all of them through this network. Last year, Project ASTRO-Tucson hosted the annual meeting of the site leaders. This year Connie Walker, Project ASTRO-Tucson Coordinator attended the annual Site Leaders Meeting held in Boston, MA. Major topics covered at the meeting included site reports and discussions on publicity, fundraising, student surveys, National Network policies, and the newly formed Family ASTRO project.

Project ASTRO
National Network

Family ASTRO: A New Initiative

Family ASTRO
a program to share the excitement of astronomy and hands-on science with whole families

With funding from the National Science Foundation, the Astronomical Society of the Pacific (ASP) has begun a new phase of educational activities bringing astronomy into homes around the country with a project called "Family ASTRO".

The ASP hopes to build a new capability into the network of Project ASTRO sites and partners around the country -- to share the excitement of astronomy and hands-on science with the whole families, instead of just students, and to encourage these families to continue exploring the sky on their own. There is evidence from the evaluation of Project ASTRO that the partners have already had some initial success drawing in families, and that a much greater potential for family involvement exists. As part of Family ASTRO, the following items are being developed:

- Family Astronomy Kits, in English and in Spanish, each containing a suite of hands-on activities that can be done with simple materials and are within the capacities of a wide range of families;

- A Family Astronomy Events Manual to help partners and site leaders use "star parties", "Sun, Moon, and Shadows" sessions, and other larger group astronomy events to draw families into the project's orbit;

- Training protocols and materials at three levels:

  - to train families in doing astronomy activities directly,

  - to train the astronomer/teacher partners to work with families, and

  - to train our regional site leaders on how best to work with their local partners to start their own Family ASTRO program.

After considerable testing, these activities will be available to the public in 2002.

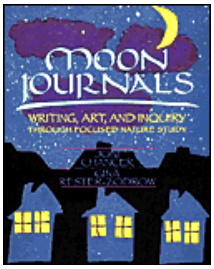
Tucson may be selected to participate as one of the first Family ASTRO sites outside of California.

What do you think? Do you see opportunities for success in your setting? E-mail Connie at cwalker@noao.edu with your thoughts.

(This article was adapted from http://www.aspsky.org/astro/family.html)

Fall Workshop Coming Up Fast

The Project ASTRO workshop this fall, to be held on September 28 and 29, will feature the theme, "Did You See the Moon Last Night? – Scientific Inquiry through Writing, Art, and Observation". The goals of this workshop are to extend the concepts from the book *Moon Journals: Art, Writing, and Inquiry Through Focused Nature Study* into the area of authentic scientific inquiry and have teachers in grades 2 - 9 work in collaboration with trained astronomers to assist with student investigations of the moon. Teachers and astronomers learn to guide their students through a month of lunar observations and explore questions that arise through writing, art, and scientific inquiry. Workshop presenters include the authors of *Moon Journals*, Joni Chancer and Gina Rester-Zodrow, as well as scientific expertise drawn from organizations represented by the Project ASTRO-Tucson coalition (NOAO, University of Arizona's Steward Observatory and Lunar Planetary Lab, the Tucson Unified School District, the Tucson Amateur Astronomy Association, and Pompea & Associates). The workshop also includes a visit to the Visitor's Center 16-inch telescope on Kitt Peak, as well as other hands-on activities in astronomy from Project ASTRO's *Universe at Your Fingertips* Resource Notebook.



This work is funded by the National Science Foundation and **only** open to new partnerships. Contact Connie at 318-8535 or cwalker@noao.edu if you have any questions about eligibility.

Updates . . .Updates . . . Updates . . .

Teacher Resources on the Web

Led by NOAO Educational Outreach, Project ASTRO-Tucson has reached over 13,000 2nd - 9th grade students over the last five years by forming ongoing partnerships of teachers and astronomers. To foster and facilitate these partnerships, the Project ASTRO-Tucson web site will soon feature resources of interest to astronomers and teachers using Project ASTRO activities. Initial highlights will include a video showing frame-by-frame impact of projectiles in flour from the popular *Universe at Your Fingertips Activity* "Experimenting with Craters" and another video showing phases of the Moon as seen from the Earth and as seen from outside the Earth-Moon-Sun system; (see Chapter 'A' on "Our Moon's Phases and Eclipses" from *Universe at Your Fingertips*). Ideas from these web pages came from discussions at our Spring Follow-up Workshop.

Teacher Accreditation

At the last follow-up workshop, some teachers were interested in finding out about accreditation for the hours spent at the workshop. These hours would help meet part of the criteria needed to maintain teaching certification and acquire salary increment. In order to follow up, please provide the name and phone number of the person in your school district to contact for forms and information.

Should you have a new Project ASTRO-Tucson partnership in the future, be attending a future workshop, and therefore need future accreditation, feel free to call me (520 318-8535) as well. I am also able to write a letter to authorities in your school district confirming participation in the workshop, should other avenues not succeed.

A Gem of an Offer

There is a limited time (until they run out) opportunity to get the GEMS Guide – "The Real Reason for the Seasons" for only the $6.00 shipping cost. You can get this special offer from NASA Central Operations for Resources for Educators (CORE) by requesting this guide donated by NASA Headquarters. As of May 7, there were only 500 and they are going *fast*. NASA CORE's phone number is (440) 774-1051. For further information, visit their web site at http://core.nasa.gov/.

Questions??
Contact the Staff of Project ASTRO-Tuscon

Connie Walker
Site Coordinator
520 318-8535
Suzanne Jacoby
Site Director
520 318-8364
Kathie Coil
Administrative Coordinator
520 318-8230

www.noao.edu/outreach
520 318-8360 fax

Success Supreme — Spring Follow-up Workshop

Thanks to
John Kalas (TAAA), Nancy Lebofsky (UA), and all the astronomers and teachers who generously contributed their time to make the March follow-up workshop a success!

Thirty-two teachers and astronomers attended the Project ASTRO follow-up workshop at NOAO headquarters in March. Presenter John Kalas (TAAA) bedazzled participants with a video showing frame-by-frame impact of projectiles in flour from the popular *Universe at Your Fingertips* activity "Experimenting with Craters". Presenter Nancy Lebofsky (University of Arizona) led participants in working with stucco to sculpt 63 boxes containing models of the surface of Venus. Thirty-five of the boxes stayed with NOAO Educational Outreach as loaners; the others went home with the teachers. These Venus topography boxes will be used in classrooms to explore methods of remote sensing as described in activity C-7 of the *Universe at Your Fingertips* Resource Notebook.

The Project ASTRO staff thanks everyone for the high ratings received from the workshop evaluation. The average score was 4.7+/- 0.2 out of 5. Items like demonstration of cratering, the workshop site and location, and the food received scores of 4.5, 4.5 and 4.6 respectively, while demonstrating the Venus topography boxes, the giveaways (topo kits and posters), and the overall workshop grades were all 4.8. The highest rating was given to the Venus topography boxes themselves – 4.9.

Creativity unleashed . . . teachers and astronomers rolled up their sleeves to build Venus topograhy boxes.

Most follow-up workshop participants agreed that the Venus topography boxes were a good hands-on, practical and useful activity and an effective use of time. Many found it useful to do what the students were going to do, taking "radar" measurements of the landing sites and graphing the results. Others also enjoyed the networking and interaction that the workshop environment provided.

Helpful suggestions were given to improve the quality of future workshops. More time might be devoted to classroom success or horror stories in order to share ideas and experiences. Some participants suggested having a choice of activities to do during the workshop in case someone had already done, e.g., Venus topography boxes. Others suggested making the workshop longer or having more follow-up workshops. And a couple people suggested more training for the astronomers in becoming more effective K-12 instructors. The final, good suggestion was a list of material resources (movies, models, equipment) related to the activity from Project ASTRO-Tucson.

The results from questionnaire ratings for resources considered for future development are (from first to last choice - all choices come from the *Universe at Your Fingertips* Resource Notebook):

1. Spectroscopes and Spectrometers (J-7)
2. Investigating Types of Stars (G-3)
3. Looking Up: Observing the Nighttime Sky (F-1)
4. Modeling the Moon Phases (A-3)
5. Observing the Sun Safely (B-2)
6. Planet Picking (C-9)
7. Making a Comet in the Classroom (E-3)
8. Solar System Bingo (C-10)
9. The 10,000 Yard Model - of the Solar System (D-7)

What do you think? Do you have comments on the suggestions for improving future workshops or on the resources for future development? E-mail Connie at cwalker@noao.edu with your thoughts.

John Kalas demonstrates the 'cratering' exercise.

Project ASTRO

Tucson

Project ASTRO Workshop

Astronomers and Teachers as Partners for Learning

Did you see the Moon Last Night? Scientific Inquiry through Writing, Art, & Observation

September 28 - 29, 2001

Follow-Up Event, Spring 2002

Teachers/Community Educators and ***Volunteer Astronomers*** will be paired as partners. Together, they will participate in a hands-on training workshop and follow-up event, receive astronomy resource materials, and develop a strategy for working together in the classroom.

Partnerships involve astronomers and teachers who commit to at least four visits per school-year. These may include hands-on activities, evening observing sessions, creating an astronomy club, going on field trips, doing science fair projects, and more!

The workshop extends concepts from the book *Moon Journals: Art, Writing, and Inquiry through Focused Nature Study* into the area of scientific inquiry. The book's authors, Joni Chancer and Gina Rester-Zodrow, will conduct sessions that introduce the teachers and astronomers to techniques integrating astronomy with writing and art.

Project ASTRO participants attend a hands-on astronomy workshop with their partners in which they learn how to: use K-12 astronomy activities to integrate astronomy, inquiry, writing, and art; become part of a growing network of Project ASTRO partners; rely on follow-up support from Project ASTRO staff; and receive helpful materials such as *The Universe at Your Fingertips: An Astronomy Activity and Resource Notebook,* resource lists, and supplies for hands-on activities.

The lead institution, *the National Optical Astronomy Observaotry, is connected to the community by a Coalition of organiztions that represents astronomy and education: Flandrau Science Center, Kitt Peak National Observatory, Lunar & Planetary Lab, Mt. Graham Discovery Park, National Solar Observatory, Pima Community College, Pompea & Associates, Steward Observatory, Whipple Observatory, Tucson Amateur Astronomy Association, Tucson Unified School District,& the US Gemini Program.*

Project ASTRO Applications

(See next two pages for applications.)

Complete and send your application to:

Connie Walker
Project ASTRO Site Coordinator
NOAO Educational Outreach Office
950 N. Cherry Ave.
Tucson, AZ 85719

PHONE: 520-318-8535
FAX (520) 318-8360
E-MAIL: cwalker@noao.edu
URL: http://www.noao.edu/outreach/astro/

September 28, 2001
Evening Trip to Kitt Peak
Night-Sky Observing and More

September 29, 2001
Hands-on Workshop

Spring 2002
Follow-up Workshop

TEACHER APPLICATION

PERSONAL INFORMATION

Name _____

Home Address _____

City _____ State _____ Zip _____

Home Phone ( ) _____

School or Organization _____

District _____

Work Address _____

City _____ State _____ Zip _____

Work County _____

Work Phone ( ) _____ Fax ( ) _____

E-mail _____

Grade _____

Subject _____

Number of years teaching experience _____

ADMINISTRATIVE SUPPORT

Administrator support leads to more successful partnerships. Please have the appropriate administrator certify support for your participation in Project ASTRO by completing and signing.

I support the the participation of _____
in Project ASTRO. *(print teacher name)*

This support includes a day off for the September workshop, planning time and allowing visits to the school by the volunteer astronomer.

Principal or Administrator's Signature:

_____

Name _____

Title _____

Date _____ Phone ( ) _____

Address _____

City _____ Zip _____

TEACHER BACKGROUND

1. Describe your formal education.

2. Rate your knowledge of astronomy (1=low, 5 = high)

   1 2 3 4 5

3. Describe professional activities, curriculum development, inser-vice activities, collaborative projects, experience with volunteers, etc.

4. Why do you want to participate in Project ASTRO?

5. How will you include astronomy in your program in 2001-2002?

6. How many classes and students would the astronomer visit?
   (we encourage focusing on no more than 2)

7. Do you have time to plan with your astronomer by phone, and before or after class?

8. Describe how you will incorporate the visiting astronomer into your program.

9. How did you hear about Project ASTRO?

Your Signature _____

Date _____

Revised 5/01

ASTRONOMER APPLICATION

PERSONAL INFORMATION

Name _____

Home Address _____

City _____ State _____ Zip _____

Home Phone ( ) _____

Employer _____

Position _____

Work Address _____

City _____ State _____ Zip _____

Number of years with this employer _____

Work Phone ( ) _____ Fax ( ) _____

E-mail _____

Teams of two astronomers from the same group or institution are encouraged to apply. List the name of your partner.

_____

(please print)

ASTRONOMER BACKGROUND

1. Briefly describe your background and experiences in astronomy.

2. Describe any experiences you have working with schools or explaining astronomy to students or the public:

3. Describe any other experience working with children:

4. List astronomy organizations you are affiliated with:

5. In what ways do you see yourself contributing to student learning and enjoyment of astronomy at a local school?

6. What grade levels do you prefer (circle all that apply)

   4 5 6 7 8 9 it doesn't matter

7. We will make every effort to place you in a school thatis convenient to you. List possible areas where you would prefer to volunteer.

8. How far are you willing to travel to your partner school?

9. How did you hear about Project ASTRO?

Your Signature _____

Date _____

Look Inside

Fall Workshop Applications

A Stellar Opportunity for Teachers and Astronomers!!

Continue your Project ASTRO with a new partnership!

Invite other Teachers and Astronomers to join our family!

Applications are being accepted for 2001/2002,
our 6th year!

Eligible applicants include new teachers and astronomers as well as teachers or astronomers who have lost their partner or wish to be paired with a new partner.

Application materials enclosed.

Project ASTRO-Tucson
ASTROGRAM
National Optical Astronomy Observatory
950 N. Cherry Avenue
Tucson, AZ 85719

NOAO is operated by the Association of Universities for Research in Astronomy (AURA), Inc. under cooperative agreement with the National Science Foundation.