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Extended Visions, January/February/March 2007

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Development Center and
UNL Extension in Saunders County

In This Issue...

ARDC Director's Comments

GNEP Proposes Opportunity for the Future

by Daniel J Duncan, ARDC Director & IANR Ag Research Division Assistant Dean and Director

The University of Nebraska has developed an investment opportunity for the Governor and Legislature to consider during the upcoming legislative session. We call this opportunity the Greater Nebraska Projects (GNEP).

The GNEP is a group of capital construction projects located outside of Lincoln. The GNEP includes office, meeting room and lab facilities at the High Plains Ag Lab near Sidney, office and lab renovations at the Haskell Building, and new swine buildings at the Haskell Ag Lab near Concord. The package also includes new swine and dairy facilities at the ARDC.

Most of the current dairy and swine facilities on the ARDC are 30 to 40 years old and have outlived their planned life. These facilities are not easily or cheaply renovated to meet current and future research demands. The new facilities will allow us to enhance current research efforts in nutrition and genetics. They could also allow research and/or demonstration in areas such as environmental stewardship, bioenergy development, odor control and nutrient management. Construction of these facilities will not only enhance research opportunities but provide critical support to the swine and dairy industries. Our desire is to build facilities and develop research and extension programming that will overcome some of the obstacles facing livestock producers in Nebraska and enable rural communities to grow and prosper.

Please note that the schedule for the next two editions of *Extended Visions* will be somewhat different. We will publish this newsletter every three months for the next two editions rather than our normal two-month time frame. This change is being made to accommodate the maternity leave of our editor, Deloris Pittman. We will resume a normal schedule beginning with our July edition. ❑

February Conference Will Help Farmers Use No-till

UNL Extension will give corn and soybean producers information on how to be successful with minimum and no-till at the Nebraska No-Till Conference.

The conference will be held from 9:30 a.m.-3:30 p.m. on February 6 at the Ag Center in Holdrege and on Feb. 7 at the ARDC. Registration begins at 9 a.m.

Producers will learn the benefits of no-till and how it can work for them, said Keith Glewen, UNL Extension Educator.

Speakers include no-till farmers, university specialists and industry representatives.

Rolf Derpsch, an international agricultural consultant specializing in conservation agriculture, no-till, cover cropping and on-farm research, is the featured speaker at both locations. He will speak on Tillage Effects on Soils Crops and Ecosystem and Critical Steps to No-Till Adoption.

Born in Chile of German parents, Derpsch currently makes his home in Paraguay. He is fluent in six languages which have been helpful in communicating about his experiences as one of the world's leading experts in no-till systems. Derpsch has done no-till consulting in 14 countries and spoken about no-till in many more.

Other topics/speakers/locations include: No-Till, Making it Work in Southwest Iowa, David Dukes, Bedford, IA (Holdrege); Crop Residue Survey and Fuel Calculator, Dan Gillespie, USDA- NRCS No-Till Specialist (ARDC); One Planter - Three Crops

NO-TILL CONFERENCES - Cont. on P. 2

ARDC Feature Unit

Behlen Observatory
Department of Physics & Astronomy

Viewing the Night Sky from the ARDC

Behlen Observatory stories by
Edward G. Schmidt, Ph.D.
Associate Dean and Professor
of Physics and Astronomy

Behlen Observatory is a research facility used by astronomers from the Department of Physics and Astronomy on the Lincoln campus. It has a 30-inch computer-controlled telescope that is equipped with state of the art instrumentation. The observatory is located at the ARDC to get away from city lights which interfere with observations. It has its own living quarters so the astronomers do not need to drive back to Lincoln after spending a long night at the telescope.

Behlen Observatory at ARDC.

The observatory was established in 1972 through a $200,000 donation by Walter Behlen, the founder and president of Behlen Manufacturing Company in Columbus, Nebraska. Mr. Behlen was an avid amateur astronomer who would invite friends and neighbors to look through his 10-inch telescope on the front porch of his home in Columbus. This telescope is currently on display at Behlen Observatory.

Mr. Behlen's 10 inch telescope.

The 30-inch Cassegrain telescope was built by Boller and Chivens Company of Pasadena, CA. The "30-inches" refers to the diameter of the main mirror of the telescope. With such a large area, it is capable of collecting 5,000 times as much light as the human eye. This light gathering power in conjunction with a sensitive electronic camera makes it possible to measure the brightnesses and

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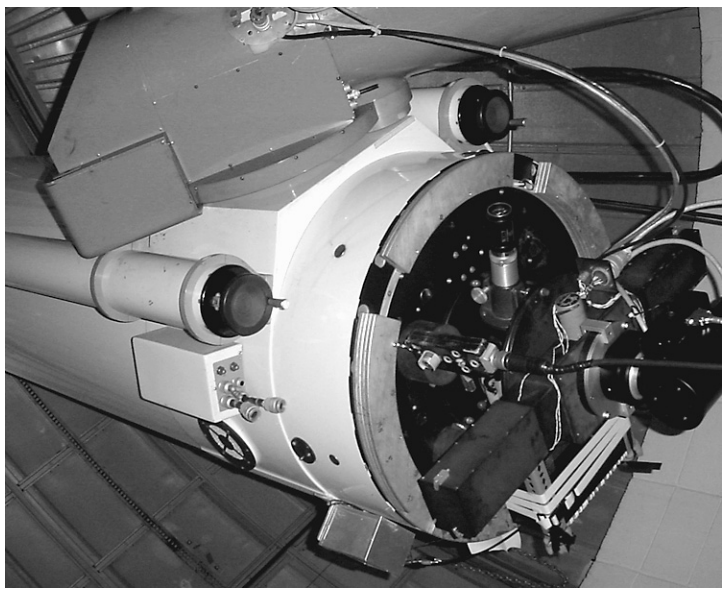
colors of stars more than 10,000 times too faint to be visible to the naked eye. The camera uses the same technology as everyday digital cameras but is cooled with liquid nitrogen to -100 degrees Celsius to permit long time-exposures.



The Behlen Observatory 30-inch telescope. The black cylinder at the bottom houses the electronic camera.

Although the telescope can be operated manually from its dome, it is generally controlled by a Pentium 4HT computer located in the control room in the main building. In addition to being more comfortable and safer for the observer than working in the darkened dome, the use of computer control enables much more efficient data gathering. The control system has been upgraded to the point where it is now possible to record nearly 200 star fields during a long winter night. This can be compared with the fifty or so that could be observed in a night before the telescope was automated.

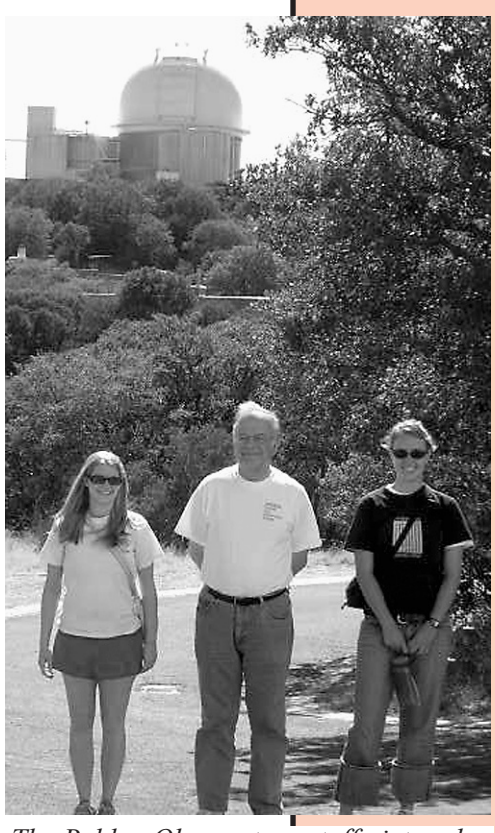
Although the 30-inch telescope is small compared with most research instruments, its availability every clear night as well as its high efficiency have allowed astronomers at the University to undertake cutting-edge astronomical research. As a consequence, research at the observatory has been supported by NSF funding and over 50 publications in leading scientific journals have been based on data taken at the observatory.

Behlen Observatory contributes to the educational mission of the University through the involvement of students in research. Over the years several dozen undergraduate students have participated in research and more than a dozen have been listed as co-authors on publications. In addition, five PhD theses have been done wholly or in part with the facilities at the observatory and eight other graduate students have conducted non-thesis research with the 30-inch telescope. ❑

Studying Variable Stars

Since its founding, the major research emphasis at Behlen Observatory has been the study of variable stars. While most stars shine steadily like the Sun, perhaps one in a hundred changes its brightness in times as short as a few minutes or as long as years.

There are many reasons that stars vary. In some double stars, one star passes in front of the other as they orbit about each other. When this happens, the star in front blocks the light from its companion and the system appears fainter. Others have large spots which make one side darker. The star appears to fade as the dark side rotates towards us and brighten when the dark side is away from us. Still other stars become unstable in the center as they evolve and eventually explode as super novae. The stars studied at Behlen Observatory are of yet another type in which outer layers of these stars are unstable and the whole star oscillates in and out. In the process, it becomes brighter and fainter. Recent research at Behlen Observatory has concentrated on one particular type of variable star known as Population II Cepheids. These stars are among the oldest of stars. While the Sun is about five billion years old, many type II Cepheids are eleven billion years of age or more. For this reason, Population II Cepheids are useful for learning about the origin and history of our galaxy, the Milky Way. Unfortunately, only a limited number of them are known which limits their usefulness.



The Behlen Observatory staff pictured at Kitt Peak National Observatory in Arizona. From left to right: Danielle Rogalla, Edward Schmidt and Lauren Thacker-Lynn. Not shown: Shawn Langan and Kevin Lee.

For the past two years Professor Edward Schmidt and students Shawn Langan, Danielle Rogalla and Lauren Thacker-Lynn have been searching for more Population II Cepheids. The search began by identifying possible variable stars in a large sky survey that was conducted in 1999 and 2000 at the Los Alamos National Laboratory in New Mexico. Images of the entire sky were taken every clear night for a year by the Laboratory staff. By comparing as many as several hundred of these images of the same part of the sky, the stars which vary can be identified. So far about 500 have been found which might be Population II Cepheids. Each of these stars is being observed repeatedly on many nights at Behlen Observatory to determine which are actually of interest. This will require taking about 16,000 images through the telescope over the course of several years.

In order to determine the properties of the stars fully, we need additional data from a

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NO-TILL CONFERENCES - Cont. from P. 1

Corn/Soybeans/Wheat, Merle Holle, Grower, Marysville, Ks and Paul Hay, UNL Extension Educator (ARDC); New Trends in Corn, Cropping, and Diseases, Tamra Jackson, UNL Extension Plant Pathologist (Holdrege); My Latest No-Till Experiences, Paul Jasa, UNL Extension Engineer (ARDC); No-Tilling Corn on Corn, Mark Schroeder, Farm Operations Manager, UNL ARDC, Mead, NE (Both); and No-Till and Fertilizer Management, Charles Shapiro, UNL Extension Soils Specialist (ARDC).

Pre-registration is due February 1.

For more information or to register at the ARDC location, call (402)624-8030 or (800)529-8030 or e-mail at kglewen1@unl.edu. For more information or to register at the Holdrege location, call (308) 995-4222 or e-mail cburr1@unl.edu. Online registration available at http://ardc.unl.edu/notill.htm.

The free event is sponsored by UNL Extension, Nebraska Soybean Board, Sustainable Agriculture and Education (SARE), Lower Platte North Natural Resources District, Tri-Basin Natural Resources District, Central Nebraska Public Power and Irrigation District, USDA Natural Resources Conservation Service, Farm Credit Services of America. John Deere Risk Protection and Ag Service Associates. ❑

ARDC Feature Unit

Behlen Observatory
Department of Physics & Astronomy

About the People

Edward G. Schmidt is an Associate Dean and Professor of Physics and Astronomy. His research interests variable star observations with a .76 m telescope. A large photometric survey of poorly studied variable stars which has been under way for about seven years is continuing. Approximately 400 stars have been observed so far. Additionally, more detailed observations are being made of individual stars found to be of special interest in the survey.

He is also analyzing ultraviolet images obtained by colleagues at the Naval Research Laboratory using electronographic cameras which are flown on various satellites. The goal is to obtain accurate ultraviolet photometry of stars which will be applied to studies of interstellar absorption and the properties of hot stars.

Research collaborators include George Carruthers of the Naval Research Laboratory, Todd Young of Wayne State College (Wayne, Nebraska), and Kevin Lee, University of Nebraska-Lincoln.

Dr. Schmidt's current research projects include: Study of the peculiar RR Lyrae Star V442 Her; Analysis of ultraviolet images of star fields; and Study of light curve anomalies among long period RR Lyrae stars. ❑

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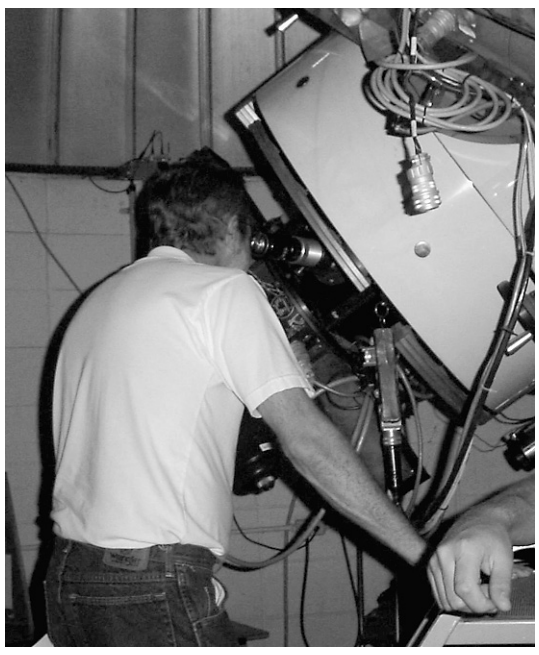
spectrograph on a larger telescope. In June, 2006, Schmidt, Rogalla and Thacker-Lynn spent a week at Kitt Peak National Observatory in Arizona using the 84-inch telescope. About one-third of the stars were observed so a couple more trips are planned to complete the project.

In the course of searching for Population II Cepheids, a new type of star was found that does not fit into any of the known classes of variable stars. While these stars are similar to Population II Cepheids in some ways, much more study is needed to learn how they relate to known types of stars and how they fit into the history of the Milky Way.

Although the Behlen Observatory telescope is relatively small as modern research telescopes go, the instrumentation is at the state of the art. For this reason, astronomers from other universities sometimes ask to use the facility. The most recent visitors were Dr. Scott Baird and two undergraduate students from Benedictine College in Atchison, Kansas. They used the observatory to measure the chemical compositions of another type of variable stars known as RR Lyrae stars. These stars are similar in age to the Population II Cepheids and are also useful in studies of the origin and history of the Milky Way. ❑

Public Nights Popular at Observatory

Behlen Observatory is open to the public one Friday night each month during the academic year. Additionally, special viewing nights are often arranged for such groups as 4-H clubs, scout troops, and classes from UNL and Union College. The past two summers participants of the Space Camp at the Strategic Air and Space Museum at Ashland spent an evening at the observatory. A night at the observatory was even auctioned last year at a fund raiser for the State Museum on the UNL campus. An average of about 550 people visit Behlen Observatory each year.



A visitor on public night looking through the 30-inch telescope.

In addition to observing various celestial objects through the 30-inch telescope visitors have the opportunity to hear a variety of talks by university faculty and students about the observatory, the night sky and other scientific topics. At the October public night Prof. Ken Bloom of the Department of Physics and Astronomy gave a talk entitled "The Quantum Universe (or, Nine Questions That Should Keep You from Sleeping)" which brought together astronomy and high energy physics. Other talks in recent years have dealt with recent discoveries in astronomy, the Mars rovers, astronomy software, Kitt Peak National Observatory and, last December, the Christmas star.

This year, new activities for children are being added though the Science and Education Partnerships in Public Outreach (SEPPO) program. This NASA funded project is directed by Prof. Kevin Lee and trains undergraduate students to conduct science outreach in the public schools. At the October public night, four SEPPO students helped young visitors make models of the planet Saturn from old CDs and styrofoam balls.

The schedule for the public nights is available at the observatory web site located at http://astro.unl.edu/observatory/index.html. School groups or others wanting to set up a special night should contact Professor Schmidt at 402-472-7304 or be email at eschmidt1@unl.edu. ❑

Astronomy Camps

Since 2001 a summer astronomy camp for high school students has been held on the UNL campus in Lincoln. Weather permitting, each evening the campers visit Behlen Observatory to use the 30-inch telescope and the 8-inch telescopes which are set up outside in the parking lot. With the larger telescope they take photos of various celestial objects including globular clusters, the Ring Nebula, the Andromeda galaxy and, last summer, the planet (or former planet) Pluto. **The camp will be held again during the week of July 15 to 21, 2007. Learn more at http://astro.unl.edu/astrocamp/camp.html.** ❑

Calendar of Events

JANUARY

16 Nitrogen Certification Training
17 Private Pesticide Applicator Training
18-19 NSFGPP Consultations
20 Private Pesticide Applicator Training
25 NSFGPP Launching Your Marketing Plan Workshop

FEBRUARY

2 Wheat Technology Conference
7 Nebraska No-Till Conference
14 Unit Managers Meeting
15-16 NSFGPP Consultations
26 IANR Planning Session

MARCH

13 Nebraska State Dairy Association Meeting
13 Nitrogen Certification Training
14 Unit Managers Meeting
15 NSFGPP Annual On-Farm Research Day
21-22 **Technology of Pesticide Application**

This workshop is part of UNL Extension's Crop Management Winter Training...Learn more at http://ardc.unl.edu/2007cmwppesticide.htm or call (402)624-8000. $50 discount for early registration.

Private Pesticide Applicator Training

Certification as a private applicator allows farmers to purchase and use restricted use pesticides in their farming operations. Private pesticide applicators with expiring certification and those seeking first-time certification will need to attend a certification training session in 2007.

UNL Extension provides the educational program, while the state ag department is responsible for certification. The training cost is $15 per person.

Private Pesticide Applicator Training will be offered at the Saunders County Extension office located at the August N. Christenson Research and Education Building at the ARDC on the following dates and times: Wednesday, January 17 - 1:00-4:00 pm ; Wednesday, January 17 - 6:30-9:30 pm; and Saturday, January 20 - 9:00-Noon. For more information, call (402)624-8030. ❑

WANTED: Master Gardeners

Do you love working in the garden? Would you like to learn more about plant culture, insect and disease problems? Then why not consider becoming a Master Gardener? Anyone with an interest in plants or gardening is welcome. Master Gardener volunteers pass along their horticulture knowledge to beginning gardeners and help them learn more about all aspects of horticulture, including growing flowers, vegetables, managing a lawn, water gardening or choosing the right landscaping tree or shrub. They also have the opportunity to meet and learn from other Master Gardeners in the community, who share their love of gardening. Training is Thursdays in March. For more information, contact Sarah Browning at (800) 830-4855. ❑

Send me information about becoming a Master Gardener!

Return to: University of Nebraska- Lincoln Extension
1206 West 23rd Street, Fremont, NE 68025 or call (800) 830-4855

Name_____

Address_____

City_____ State_____

Zip_____ Phone_____

E-mail Address_____

On-Farm Research to be Highlighted on March 15

Corn and soybean growers are invited to attend the Nebraska Soybean and Feed Grains Profitability Project on-farm research update March 15 at the ARDC.

The 9 a.m.-3 p.m. program will be at the August N. Christenson Research and Education Building.

Producers will obtain valuable crop production-related information from on-farm research projects conducted on Nebraska farms by Nebraska farmers.

The Nebraska Soybean and Feed Grains Profitability Project is an on-farm research project designed to provide farm operators with an understanding of how to conduct crop research on their farms using their own machinery. Comparisons are scientifically designed, statistically analyzed and conducted for three years to assure reliable, useful information.

Registration is $25 for non-NSFGPP members and includes a copy of the annual on-farm research report, refreshments and noon luncheon. Pre-registration is encouraged by March 6. To register or for more information about the Nebraska Soybean and Feed Grains Profitability Project or how to conduct crop-related research on your farm, call (800) 529-8030 or visit http://on-farmresearch.unl.edu/. ❑

Horticulture Programs

Creating a Horticulture Paradise
7-9 p.m., New Location- First State Bank, 1005 E. 23rd Street, Fremont
Cost- Free, but preregistration is required. Call 721-2500 Ask for Cindy or Angela.
Feb. 20- Heirloom Vegetables
Feb. 27- Beware of Hitchhikers- Japanese Beetles In Your Landscape
March 6- The Shady Side of Gardening
March 13- Pruning Ornamental Plants
March 20- Emerald Ash Borer & Other Exotic Pests.

Acreage Programming
1206 W 23rd Street, Fremont
Contact- Sarah Browning, (800) 830-4855, sbrowning2@unl.edu.
Cost- $10.00/person pre-registration, $15.00/person at the door
Jan 20, 9-11 a.m., In the Vegetable Garden-Melons, Squash & Gourds
Feb 24, 9-11 a.m., Acreage Landscape Design Basics
March 24, 9-11 a.m., Growing for Farmer's Markets
April 17- 7-9 pm., Management of Small Ponds ❑

4-H Market Cattle Weigh-In Dates

The 2007 4-H/FFA beef weigh-in will be January 20 & March 24 at the Wahoo Sale Barn from 1 - 3 p.m. All market heifers and steers will need to be tagged, weighed and nose printed. ❑

M.E.A.D
Making Education in Agriculture Different

Valuable Lessons Learned

by Mead Ag Department at Mead Public Schools

How does food, no notes, and talking during class sound to high school students? Great, you would imagine! As part of the Human Leadership course taught in the Agriculture Department, one time per month we do just that.

Each semester amongst some of the topics like stress, self concept, and values, the students also determine a "service learning project". A service learning project is to meet the need of a community and impact people.

The class brainstormed and elected to invite in community residents, maybe retired, to "hang out with" and get to know each other through a variety of activities that the students plan. The students and community members meet during class one time per month.

At a recent gathering, students brought in recipes and samples of their favorite soups, pastries, and dips for all to try. Students shared their recipes in small groups with the guests. Some of the students brought in traditional family secrets, while others brought in quick, easy to whip up snack dishes.

MPS Seniors Duane Campbell and Dan Parsons (right) participate in a recipe exchange with Mead community guests.

The students only have good things to say regarding the gatherings. Senior Duane Campbell said, "It's fun to visit with my other classmates grandmas. They're cool!" The students look forward to planning for the community members and would like to meet more often.

Some of life's most valuable lessons are learned from those that are older in age, but youngest at heart! It's not only an opportunity for the Mead students to relate to people outside of their friends, but a chance to appreciate others. The media paints negative pictures of kids and violence on a daily basis. Here's a great example of students making a difference in a positive way! ❑

Irrigation and Energy Conservation Workshop for Corn Growers

Nebraska corn growers are constantly challenged to grow corn responsibly using proven best-management practices. Surface and groundwater irrigation management is on the top of the list. The ***IRRIGATION AND ENERGY CONSERVATION WORKSHOP FOR CORN GROWERS*** is brought to you by the Nebraska Corn Board and the Nebraska Corn Growers Association in partnership with University of Nebraska-Lincoln Extension. This special training session will provide you with valuable information on irrigation management that will help you save water and money.

The workshop will focus on the Fundamentals of Agriculture Water Management and Irrigation System Management. By participating in the training, irrigated corn growers will learn how to:

- Apply less water and maximize the value of water.
- Reduce irrigation pumping costs.
- Further protect and enhance the environment.
- Be aware of new technological advances in water management.
- Use information relative to your farming operation that when implemented will enhance profitability.

Locations include: Norfolk - February 13 * Lifelong Learning Center (Limited to first 75 registrants); Cozad - February 14 * Elk's Club (Limited to first 100 registrants); and Geneva - February 15 - Ag Hall at the Fairgrounds (Limited to first 100 registrants).

The complementary registration fee is provided in part through funding by the Nebraska Corn Board and the Nebraska Corn Growers Association. Certified Crop Advisor credits are available. For more information or to register, call (800) 529-8030, fax (402) 624-8010, or e-mail kglewen1@unl.edu. ❑

This issue of *Extended Visions* was produced and edited by Deloris Pittman, Marketing & Promotions Manager. Extended Visions is published bimonthly by the University of Nebraska-Lincoln ARDC & University of Nebraska-Lincoln Extension in Saunders County, 1071 County Road G, Room A, Ithaca, Nebraska, 68033-2234. For more information, call 402-624-8000 or 1-800-529-8030. Check out our web site at http://ardc.unl.edu. E-mail dpittman1@unl.edu.
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Behlen Observatory stories by Edward G. Schmidt, Ph.D., Associate Dean of Arts and Sciences and Professor of Physics and Astronomy