



# Physics Newsletter

## Nethika Ariyasinghe named Star Student



*Is that a physics textbook she's holding?*  
Nethika Ariyasinghe, daughter of our own Associate Professor Wickramasinghe Ariyasinghe, graces the cover of the January 2009 issue of the Wacoan magazine. Nethika was highlighted in the Wacoan magazine as one of the Star Student award winners.

### Inside this issue:

Gordon Teal	2
Development	2
Dates & Deadlines	3
Graduate Program News	3
Alumni News	4
Out & About	5
Calendars	6

### Special points of interest:

- URSA Deadlines in April
- Dr. Julia Chan visit
- Orion Nebula image from telescope
- Local eagles demonstrate the physics of flight
- Admissions Office luncheons
- Preliminary Exam date set

Baylor University  
**PHYSICS**



## Gordon Teal

Reprinted from the February 25, 2009 issue of Baylor Proud

Dallas-based Texas Instruments is credited with creating the first silicon transistor, an invention that is at the heart of modern technology. Today's radios, telephones and computers never would have existed if not for the transistor. And who was leading that Texas Instruments team? Baylor alumnus Gordon Teal, who for his work will be inducted into the Inventors Hall of Fame in May.

Teal, a Dallas native, originally planned to go to MIT but instead enrolled at Baylor to be closer to home. He earned his degree in chemistry in just three years, also finding time to letter in track and participate in Chamber before graduating in 1927. (He also met his wife, Lyda, at Baylor, and speaks highly of the university in this interview from 1991.)

After working on the first germanium transistors at Bell Labs, Teal moved back to Texas to work for the relatively young Texas Instruments in 1953. There, he helped lead the team that created the first commercial silicon transistor, making a splash when he introduced the company's work during a national conference in 1954, at a time when most researchers thought that producing a silicon transistor was just too difficult. Teal and TI proved them wrong. Three years later, one of Teal's staffers created the first integrated circuit — another major step toward today's computers.

In 1965, Teal and Earl C. Hankamer (as in Hankamer School of Business) were the first two recipients of the Baylor Alumni Association's Distinguished Alumni Award. The University also offers the Gordon K. Teal Scholarship in Physics "for undergraduate physics majors with outstanding grades."



In the last newsletter, we highlighted the new goals of the Physics Department in 2009, and how the goals to **Bolster** undergraduate research, **Underwrite** new scholarships, **Improve** faculty acclaim, **Link** to outside support and **Develop** new programs formed the theme **BUILD** for the new year. As part of this effort, the newsletter will feature little logos that highlight which components of the theme that the news items reflect. So, perhaps you noticed the **U** icon in the titles for the story above that relates to an ongoing scholarship and support effort and opportunity for our undergraduate students.

### Investing in a changing world

With every new discovery, the physical view of the world changes. In the past year, Baylor physics faculty members have made noteworthy advancements in a variety of areas changing how we view the world. But a few things will always remain the same at Baylor's Physics Department:

- our commitment to superior classroom and research opportunities for undergraduate and graduate students, and
- the need for financial support to make that high-quality education possible.

Fortunately, there are a few ways you can help:

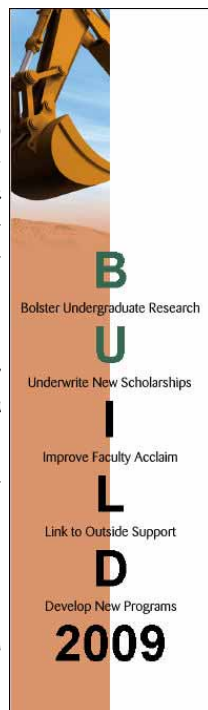
**Endowed Excellence Fund**—Support of this fund provides for equipment upgrades and faculty travel, both crucial to educating our students with the latest tools and breakthroughs in physics.

**Endowed Student Scholarships**—Scholarships, which can be awarded based on need and/or merit, help us attract and retain the best and brightest graduate and undergraduate students.

**Special Projects**, such as the **Observatory Fund**—The department hopes to add a hands-on observatory close to campus for student use. The department is in the process of researching the needs to complete this project—anticipating costs to be roughly \$130,000—and the observatory would be available for a naming opportunity based on individual support.

Consider your gift an investment in the latest innovations in superstring theory, elementary particle physics, granular physics, semiconductor lasers and the other exciting research projects happening at Baylor. Think of it as an investment in Baylor physics students. Every gift makes a difference.

If you would like information about making a gift to the Physics Department, please contact **Eric Abercrombie** at 254.710.8313 or [Eric\\_Abercrombie@baylor.edu](mailto:Eric_Abercrombie@baylor.edu). You also may complete your gift on our secure online giving site at [www.baylor.edu/give](http://www.baylor.edu/give).



## Dates and Deadlines ...

The Preliminary Examination Committee has set the date for this year's exam, which will be administered **May 29-30**.

The Society of Physics Students is asking for design suggestions for this year's T-shirts. Entries are due by midnight **March 31**. Email your ideas to [Eileen\\_Fernandez@baylor.edu](mailto:Eileen_Fernandez@baylor.edu)

Every year the Admissions Office sponsors luncheons for our high school counselors in various TX cities. This is an opportunity for us to recognize them by providing them with a delicious lunch, information on new majors or admissions policies and hearing from a current student and faculty member and their unique perspective.

Generally we leave between 7:30 - 8:30 am and return around 3 or 4 pm (of course these vary based upon the distance). Below you will see the dates of these events and the cities we will be visiting. Please let me know if you are available and willing to participate; we would love to have you.

Monday, **March 30** ~ Tyler (The Potpourri House)

Tuesday, **March 31** ~ Fort Worth (Romano's Macaroni Grill)

Thursday, **April 2** ~ San Antonio (Maggiano's Little Italy)

Tuesday, **April 7** ~ Corpus Christi (Landry's Seafood)

Please don't hesitate to call or email Melissa Taylor, Baylor University, Assistant Director of Admission Services with questions. Her extension is 8651.



## URSA

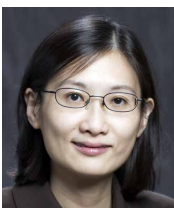


As you know, URSA's University Scholars Week is a time for our undergraduates to showcase their scholarship. Encouraging undergraduates to work with faculty on scholarship of their own, whether research or other creative endeavors, is an important purpose of URSA.

Would you take a moment to encourage your faculty who teach lower level courses to involve their students in the event? For example, an exercise based on attending a presentation or reviewing poster presentations or attending a creative exhibition could provide the spark that encourages students to develop their own scholarship.

Please remind all faculty of the deadline for submission of abstracts, **April 6**, so that we can get the presentations scheduled and promoted. Each department will also select a best paper or presentation during the event, to be recognized on Thursday, April 26. You may want to select a committee of faculty to attend and judge, or allow all attending faculty to judge. However you intend to judge the work, please let us know who will be in charge of the judging so we can follow up accordingly.

Thanks so much for your support. Frieda Blackwell and Jeff Tanner, Co-Chairs, URSA's University Scholars Week



Dr. Julia Chan plans to visit Baylor on **April 7** and expressed an interest in visiting with faculty in condensed matter physics and materials, which include Drs. Benesh, Park, Russell, and Linda and Jeff Olafsen. She plans to fly into Austin, drive to Texas State and then to Waco, and then fly out of Waco back to Baton Rouge.



## Graduate Program News



The Physics Graduate Faculty met on Feb. 5, 2009. The agenda for the semester was presented, including work on 1) Graduate Faculty Status 2) SACS Assessment Reports and 3) physics graduate student course schedule guidelines. Five graduate student Teaching Assistantship offers have been made so far. All are with stipend enhancements, ranging from \$6,000 to \$3,000. The STEM stipend increase has raised the base stipend now to \$19,000/year.

## Alumni News ...

**Name:** Jason Allan Saunders

**Graduating Class:** 2000, B.S. degree in Physics

**News:** "I've been practicing intellectual property law since graduating from the University of Houston Law Center in 2003. My practice has primarily focused on patent litigation, although I also handle patent prosecution, trademark and copyright issues as well."

Jason is an Associate of Arnold & Knobloch, L.L.P., which was established in 1996. From their website: The firm's attorneys have extensive patent prosecution, litigation, appellate and licensing experience in a variety of technical areas. Those areas include: semiconductor manufacturing, microprocessors, tire manufacturing, medical devices, internal combustion engines, fuel injectors, signal processing, fly-by-wire systems, software and communication protocols, optics, lasers, fiber-optics, night vision optics, flat panel displays, geophysics, drilling technologies, recording systems and connectors, database structures and other computer metallurgy, foundry technology, refractory chemistry, water purification, complex mechanical systems, paper products, thermodynamics, hydraulics, injection molding, charge-coupled devices, displacement ship hulls, global positioning and other navigation systems and other areas.



We're sure that Jason's work in Physics I lab with a balance had something to do with his career path.

## Our Condolences ...

Linda Kinslow's mother passed away on January 15th. Linda also has a brother, sister-in-law, and two nephews that live in the area. Please remember the Kinslow family in your prayers during this especially difficult time.



## Bald Eagles Nesting in Waco ...

Bald eagles build their nests in large trees near rivers or coasts. A typical nest is around 5 feet in diameter. Eagles often use the same nest year after year. Over the years, some nests have become enormous, as much as 9 feet in diameter, weighing two tons, sometimes 20ft deep. Even when a nest tree falls or a strong wind blows a nest down, the established pair usually rebuilds at or near the site within a few weeks if it is near the breeding season. The nest may be built in a tree, on a cliff, or even on the ground if there are no other options available. Eagles are territorial during nesting season. They will keep other eagles out of their own nesting area. Their nesting territory is usually one to two square miles. This Waco Eagle is very protective of its nest.

*Editor's note:*

We'd like to thank Brian Boyd for sharing his photographs of the bald eagles nesting here in Waco. From our point of view, the eagle is an impressive example of the physics of flight.

Notice in the picture to the right how the eagle trims its wings to slow its approach to the nest. This is the same principle for flaps on man-made aircraft.



## Out and About ...

# B U I L D

On behalf of the Experimental High Energy Physics group, **Dr. Jay R. Dittmann** submitted a Progress Report to the U.S. Department of Energy on February 27 for continuation of external grant funding for the next fiscal year from June 1, 2009 to May 31, 2010. The Experimental HEP group currently receives funding at the level of \$80,000 each year from the Department of Energy to support personnel, travel, equipment, and other costs. Members of the Experimental HEP group include **Dr. Dittmann, Dr. Nils Krumnack, Sam Hewamanage, Martin Frank, Karen Bland, Zhenbin (Ben) Wu, and Scott Ruhnau.**

Baylor's High Energy Physics group held its first annual "High Energy Mini Symposium" on January 8 and 9. The symposium included a variety of presentations on topics such as Higgs Boson physics, the internet, video conferencing, designing efficient C++ code, unix command tricks, unix editors, physics careers, and more.

Texas Congressman Chet Edwards secured \$196,514 for equipment at a new workforce development and training program as part of the **Baylor Advanced Research Institute (BARI)**. In partnership with Texas State Technical College (TSTC), the program will establish research-related training experiences for Baylor University undergraduate and graduate students in the leading fields of science, engineering, and technology.

Physics Ph.D. student **Martin Frank** will be giving a presentation on the search for the Higgs Boson at CDF using WH events at the American Physical Society April meeting from May 2-5 in Denver, Colorado.

The Department of Physics made an excellent showing at the Central Texas Science and Engineering Fair on February 24. **Professors Wickram Ariyasinghe, Gerald Cleaver, Linda Olafsen, Anzhong Wang, and Walter Wilcox**, as well as postdoctoral researcher **Victor Land**, graduate student **Karen Bland**, and senior physics major **Kristin Combs** all served as judges at the fair held at Texas State Technical College. Everyone served on different teams and evaluated projects not just in Physics and Astronomy, but also in areas such as Mathematical Sciences, Materials and Bioengineering, and Electrical and Mechanical Engineering (to name a few). **Dr. Anzhong Wang** had the opportunity to judge team projects, while most others viewed individual projects.

**Dr. Linda Olafsen** has submitted grant proposals to the NSF Major Research Instrumentation program ("MRI: Development of a Novel Optical Characterization Suite for Mid-Infrared Devices") and the DARPA Young Faculty Award ("Novel Optical Characterization Techniques for Enhancing Mid-Infrared Semiconductor Lasers").

"Heteroepitaxial Thin Film of Iron Phthalocyanine on Ag(111)," K. Manandhar, **K. T. Park**, S. Ma, and J. Hrbek, Surf. Sci. 603, 636 (2009) has been published.

**Dr Ken Park** also submitted a proposal "Nanoclusters of Reducible Transition Metal Oxides on Surface," to the Welch Foundation.

Our own **Dr. Dwight Russell** appeared on the local KWTX channel talking about meteorites. The link is below. Enjoy!

<http://www.kwtx.com/home/headlines/39883637.html>

**Dr. Yungui Gong** paid a visit to our Department during the time Jan. 10 - Feb. 27, 2009 and gave a colloquium on February 18th.

**Andreas Tziolas** is scheduled to defend his Ph.D. dissertation on March 16, 2009.

A number of faculty have given short research talks as part of graduate colloquium, including **Drs. Gerald Cleaver, Jay Dittmann, Linda Olafsen, Jeffrey Olafsen, Ken Park and Walter Wilcox.**

**Dr. Walter Wilcox** submitted a URC research proposal entitled "Eigenspectrum Noise Subtraction Techniques in Lattice QCD".

**Dr. Jeffrey Olafsen** submitted a Welch proposal entitled "The Physics of Folding in Non-Equilibrium Systems with Lennard-Jones potentials."



The picture here is our 'First Light' taken by **Kristen Pechan, Dwight Russell** and friends using the department's telescope and CCD camera set-up. The telescope is an 11" Celestron Nextar system with computer controlled positioning and tracking. The camera is a SBIG ST-237. In order to get an image the size of the Orion Nebula (about a 1/3 the size of the Moon) the CCD camera is mounted at the prime focus of the telescope using FASTAR optics. The color image is a composite of three images taken with color filters. Red and Green filter exposures were for 30s each and the Blue filter exposure was for 1:00 minute. CCD chips are typically less sensitive to Blue light so longer exposures are needed to get proper matching with the Green and Red. Not bad for First Light! Just wait for things to come.

# March 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b> Colloq 4 - 5 pm	<b>5</b> Retiree Coffee 10:30	<b>6</b> Colloq 3:30 - 4:30pm	<b>7</b> Spring Break begins
<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
<b>15</b> Spring Break ends	<b>16</b>	<b>17</b> SPS	<b>18</b>	<b>19</b>	<b>20</b> Grad Colloq 3:30	<b>21</b>
<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b> Grad Colloq 3:30	<b>28</b>
<b>29</b>	<b>30</b>	<b>31</b>				

# April 2009

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			<b>1</b>	<b>2</b> Retiree Coffee 10:30	<b>3</b> Grad Colloq 3:30	<b>4</b>
<b>5</b>	<b>6</b> URSA wk applications	<b>7</b> SPS	<b>8</b>	<b>9</b>	<b>10</b> Good Friday	<b>11</b>
<b>12</b> Easter	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b> Grad Colloq 3:30	<b>18</b>
<b>19</b>	<b>20</b>	<b>21</b>	<b>22</b>	<b>23</b> Diadeloso	<b>24</b> Grad Colloq 3:30	<b>25</b>
<b>26</b>	<b>27</b> URSA week	<b>28</b> SPS	<b>29</b> 4196 Colloq 4 pm	<b>30</b>	May 1 4196 talks 3:30 pm Grad Colloq.	May 1 Last Day of Class