



## It's About TIMED: APL's Education and Public Outreach Initiative

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**T**he Laboratory's education and public outreach (E/PO) campaign, "TIMED: A Mission to Explore One of the Last Frontiers in Earth's Atmosphere," was developed to fulfill two missions: (1) NASA's requirement that E/PO is to be a significant component of agency-supported activities, and (2) APL's commitment to education. Both NASA and the Laboratory believe that they have an important role in enhancing the space science knowledge of students, teachers, and the general public. This article presents the many avenues used by APL to inspire students of all ages to learn about and become involved in the exploration of space.

### INTRODUCTION

The Thermosphere, Ionosphere, Mesosphere Energetics and Dynamics (TIMED) mission provides an exciting opportunity for students of all ages to explore one of the last frontiers in Earth's atmosphere. The Education and Public Outreach (E/PO) Office of APL's Space Department—in keeping with NASA's vision to inspire the next generation of space explorers and its requirement that E/PO be an essential part of NASA-supported missions and programs—strives to stimulate the public's imagination by creating hands-on, "minds-on" learning experiences that will enhance their understanding of space exploration.

The Space Department's E/PO Office and the Laboratory's Office of Communications and Public Affairs have partnered to design a comprehensive and robust campaign—"TIMED: A Mission to Explore One of the Last Frontiers in Earth's Atmosphere." Throughout the mission, the multidisciplinary team has been

developing materials that serve students, teachers, museum and science center personnel, the media, and the general public.

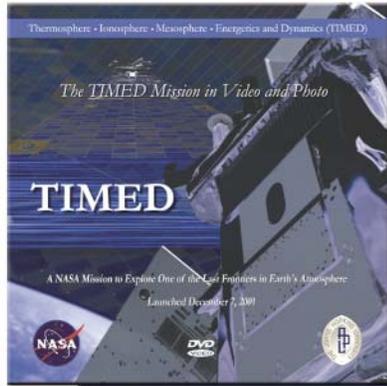
This campaign continues APL's heritage of involvement in education and public outreach. The TIMED E/PO effort has capitalized on new trends in technology, developing videotapes, DVDs, Web sites, press kits, curricula for educators, and many interactive opportunities to engage the public in discovery and exploration and to carry out NASA's educational goals.

### MERGING MISSION AND TECHNOLOGY

The TIMED Web site ([www.timed.jhuapl.edu](http://www.timed.jhuapl.edu)) is the main delivery vehicle for all mission-related information. During the December 2001 launch, 172,750 hits were recorded; after the April 2002 solar storms, when

TIMED's data were posted, the site had 113,516 visitors. Educational materials are routinely developed and posted online so that team members can easily relay them to teachers and students at on- and off-site workshops and events. The TIMED Web site is also used to distribute information to the media and general public.

In addition to the mission's Web site, many TIMED-related videos, images, and mission briefings are made available on DVD. More than 400 DVDs, as well as printed materials, were distributed to space science-related members of the Association of Science-Technology Centers, which enabled hundreds of museums and science centers nationwide to showcase TIMED.



Featured on the DVD are two mission videos that focus on TIMED's goals and science objectives. "TIMED—Closing the Link in the Sun-Earth Connection" is a 26-minute documentary-style pre-launch video that delineates the mission goals, science objectives, spacecraft engineering, and TIMED's role within NASA's Solar Terrestrial Probes program. A 20-minute post-launch video, "TIMED—Merging Mission and Technology," chronicles how the mission team merged state-of-the-art engineering and mission-developed technologies to meet TIMED's goals and science objectives.<sup>1</sup>

The DVD's Special Features section contains the pre-launch NASA science briefing that aired on NASA Television; 25 minutes of selected launch footage, provided by Boeing and Vandenberg Air Force Base, of the Boeing Delta-II rocket carrying the TIMED and Jason-1 spacecraft into orbit; and a photo essay with behind-the-scenes images of the TIMED spacecraft and mission team from spacecraft assembly through launch.

## TIMED IN THE NEWS

APL's significant role in the TIMED mission has provided several opportunities to promote the mission and its data to the media and general public. Through numerous press releases and media-related events, such as press conferences and tours, reporters have been able to learn about the TIMED mission, the spacecraft's launch and operations, and the mission's progress.

The Laboratory developed its first-ever interactive press kit for TIMED, which enabled the media to more efficiently and accurately represent both TIMED's and the Laboratory's interests during launch-related activities.

This press kit, initially distributed on CD prior to launch, is available on the mission's Web site, [www.timed.jhuapl.edu/press2/press\\_kit/start.html](http://www.timed.jhuapl.edu/press2/press_kit/start.html), and has set a standard for future APL space missions.

The Web-based newsroom is regularly updated with press releases, articles, images, and information on TIMED's appearance in the news. Materials are available to reporters online or in hard copy to help them prepare TIMED-related articles. These sources include a 15-page guide highlighting the mission, spacecraft, and mission team; a 2-page fact sheet; a list of quick facts; images and animation;



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a link to NASA TV—monitored by dozens of TV stations nationwide—where several TIMED-related press conferences and videos have aired; and contacts at APL and NASA to give reporters additional information and assist them in arranging interviews with various TIMED team members.

TIMED has received much national and international print and broadcast media coverage. Articles have appeared in *Space News*, *Aviation Week & Space Technology*, and *Popular Science*, to name only a few, and broadcasts have aired on more than 40 TV and radio stations from coast to coast. These publications and broadcast stations are listed at [www.timed.jhuapl.edu/press2/intheNews.html](http://www.timed.jhuapl.edu/press2/intheNews.html).

## BUILDING PARTNERSHIPS

TIMED's formal education program conforms to national standards by building on existing partnerships with professional educators and organizations. Using print media, workshops, and a variety of communication tools to disseminate materials and models to educators, the TIMED program offers teachers ideas on how they can incorporate the mission and the topic of Sun-Earth connections into their classrooms.

APL's TIMED E/PO program has built a strong partnership with SpaceLink, the Space Science and Astronomy Update Center at the Maryland Science Center in Baltimore. Part media center, discovery room, and newsroom, SpaceLink brings the public the "latest and greatest" in space science and astronomy. TIMED scientists and engineers regularly support SpaceLink's flexible programming, including monthly credited seminars for educators (Teachers' Thursdays), a menu of classroom programs on request, distance-learning teacher presentations, and special live events to highlight mission milestones and space-related anniversaries. These events allow TIMED scientists and engineers to interact directly with the public and complement the TIMED exhibits housed at the Science Center.



TIMED also supports a teacher internship program that pairs educators with mentors from the many disciplines involved in the mission. These teams develop mission-related curricula that are made available to instructors via TIMED's Web site. This enables educators to field-test the material in their own classrooms. Interns are encouraged to conduct TIMED-related workshops at educator conferences to introduce their curricula to classrooms across the nation. The TIMED program is building a cadre of educators who integrate TIMED science into their classrooms, educating hundreds of students on the mission and its science results.

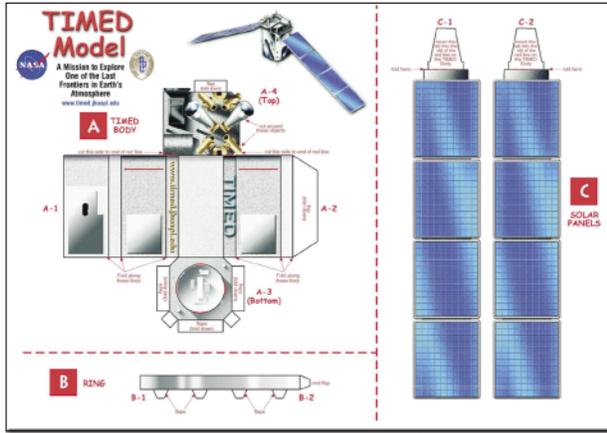
The TIMED E/PO effort is committed to creating teacher training opportunities to keep educators abreast of current mission results and activities. Recently APL provided training on TIMED and Sun-Earth connections for Howard County High School physics teachers as part of their in-service training.

## CREATING HANDS-ON EXPERIENCES

Along with the teacher internship program mentioned above, the E/PO Office and TIMED teacher interns recently developed hands-on classroom activities for grades K–8. These activities allow students to fabricate a spacecraft model and mission-related mobile while engaging in reading and writing exercises.

The Laboratory also plays a significant role in two major educational projects: Space Academy and the Maryland Summer Center for Space Science. The E/PO Office created the “Space Academy” series—sponsored by APL, Comcast Cable, and the Discovery Channel—to give middle school students a behind-the-scenes look at actual space missions, such as TIMED, and introduce them to engineers and scientists working on NASA projects.

Through two such events called “Space Academy: Mission TIMED,” more than 200 students and teachers from a number of Maryland middle schools got a close-up view of NASA’s first Solar Terrestrial Probes program mission. Weeks before the events, students focused on the TIMED mission, its science theme, and space-related careers through classroom activities and videos developed by APL and the Discovery Channel. Students also participated in a press conference, with leading APL and NASA mission team members serving as panelists and the students as reporters. After learning why spacecraft engineers wear white outfits called “clean-room suits” throughout spacecraft construction and testing, students dined with TIMED scientists and engineers, and



then donned specially designed clean-room suits of their own for a tour of the Laboratory’s space facilities. APL TIMED team members led student groups through a series of “exploration stations” that included the TIMED spacecraft’s Mission Operations Center, which is used to control the spacecraft, and a satellite communications facility, which is used to communicate with the spacecraft during its 2-year mission. Students also participated in a variety of mission-related hands-on science demonstrations. At the conclusion of the event, students engaged in follow-up activities focused on the mission and their experiences during Space Academy. The Space Academy program Web site, [www.spaceacademy.jhuapl.edu](http://www.spaceacademy.jhuapl.edu), showcases these events and student activities.

The second major educational venue for TIMED is the annual Maryland Summer Center for Space Science, sponsored by the Maryland State Department of Education and hosted by APL. This 2-week event enables rising sixth- and seventh-grade students to learn how to harness the power of technology and keep pace with the expanding knowledge of space science. Students experience the process involved in planning the TIMED mission, designing and fabricating instrumentation, and launching the spacecraft. They form simulated mission teams that build a spacecraft scale model—complete with instrumentation—and present a full mission overview to their peers. During this experience, the students interact with TIMED scientists and engineers directly responsible for carrying out the mission.

## CONCLUSION

In support of NASA’s goal to inspire the next generation of space explorers, the Laboratory has developed an array of materials to motivate students, enhance



curricula, and enlighten the general public about the TIMED mission. The APL E/PO campaign, "TIMED: A Mission to Explore One of the Last Frontiers in Earth's Atmosphere," is integral to making education part of NASA's core mission.

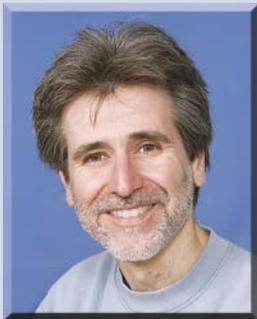
## NOTE

<sup>1</sup>The two videos, "TIMED—Closing the Link in the Sun-Earth Connection" and "TIMED—Merging Mission and Technology," received the Finalist Telly Awards in 2000 and 2002, respectively. The Telly Awards are one of the most popular and sought after international video recognition award programs. The videos are the work of the Technical Communications Group's AV/TV/Photographic Services and specifically Richard L. Goldberg (writer-producer-director), John E. O'Brien (production executive), Lee J. Hobson (video editor, videographer), Steven P. Gribben (3-D modeling and animation), Jay W. Riffin (graphics and animation), Gerald A. Bennett (videographer), and Cheryll J. Wenchel (production secretary). The TIMED videos can be viewed online at [www.timed.jhuapl.edu/press2/images.htm](http://www.timed.jhuapl.edu/press2/images.htm).

## THE AUTHORS



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KRISTI D. MARREN, of APL's Office of Communications and Public Affairs, is a member of the Senior Professional Staff. She received a B.S. in communications from the University of Tennessee in 1989. Before joining APL, Mrs. Marren worked at the Arnold Engineering Development Center (AEDC), Arnold AFB, Tennessee, where she produced marketing presentations, promoted the center's role in technical programs through articles and press releases, and helped launch the video production business for a Ballistic Missile Defense Organization data center at AEDC. She also served as editor of the data center's newsletter and created print- and Web-based promotional materials. Since joining APL in 1996 as a public affairs representative, Mrs. Marren has created and disseminated material on the Laboratory's accomplishments for a wide variety of space- and defense-related programs, including TIMED. She is also managing editor of the *APL News*. Her e-mail address is [kristi.marren@jhuapl.edu](mailto:kristi.marren@jhuapl.edu).