

Tactile & Technology Focus Group (TTFG)



ORGANIZERS:

DePaul Space Science Center for Education and Outreach, Origins Education Forum & Southeast Regional Clearinghouse (SERCH)

INSIDE THIS ISSUE:

Guidelines for Tactile Graphics

Touch the Sun Book Launching

Adapted Mathematics for Blind Students

Physics and Astronomy are Inclusive

The Standard Touch

ABOUT TTFG



UPCOMING...

Tactile Graphics 2005: Third International Conference

**December 1-2, 2005
Birmingham, UK**

Design, production, procurement, use and support of tactile graphics

American Geophysical Union Fall Meeting

**December 5-9, 2005
San Francisco, CA**

Special session titled, "Reaching New Learners: Tools for Educating and Inspiring Nontraditional Learners."

Guidelines for Tactile Graphics

By: Lucia Hasty

Content presented in earth and space science materials are heavily dependent on graphics to supplement text descriptions of the abstract concepts. Students who read braille require that graphic information in a tactile version. The braille reader can be successful in interpreting tactile graphics when there is consistency in the symbols used to represent the visual information.

Through a joint project, Braille Authority of North America (BANA) and Canadian Braille Authority (CBA) will soon publish official guidelines and standards for production of tactile graphics. The document has been developed after extensive review of relevant research, including Graphics Research and Standards Project (GRASP) 2003, and a review of best practices used in production of tactile graphics in North America.

The *Guidelines* cover graphics for all subject areas typically included in curriculum for grades K-12. The current BANA official standard for math diagrams, *Guidelines for Mathematical Diagrams 1983*, has been incorporated and expanded in the new *Guidelines*. The new publication also includes over 40 examples of tactile graphics produced in thermoform, capsule paper, and computer-designed and embossed production methods.

Highlights include Criteria for Production, Design Principles, Planning and Editing, Production Techniques, Format and Layout, Graphics Produced in Supplement form, and Proofreading. The Appendix includes examples of braille fonts, standard keys for labels, texture palettes for computer graphics and other frequently requested information.

Watch this publication for more details and release date, projected for 2006.

For further information, contact Lucia Hasty, chair, BANA Technical Committee on Tactile Graphics: Lhasty2@earthlink.net or 719-577-4710.



NFB Jernigan Institute Launches NASA Book, "Touch the Sun" December 2, 2005 | Baltimore, MD

In *Touch the Sun*, Noreen Grice innovatively pairs breathtaking color photographs with tactile renderings of the images. Using an effective combination of words, pictures, full-color, tactile images are paired with print and Braille text to convey the dynamic nature of our closest star. Contact Mark Riccobono at mriccobono@nfb.org for more information.

Adapted Mathematics for Blind Students

By: Gloria María Isidro Villamizar and Dr. Carmen Pantoja

Mathematics education for blind students requires special materials to complement the lessons.

When a blind student arrives to a mathematics class, the use of visual graphics always causes inconveniences. It is necessary to have alternate tactile didactic material available to eliminate the need of visual plane graphs. These tactile materials should allow the students to feel the spatial location and imagine the graphs with which they are working as they are interpreting what they are learning and can develop the concepts which are being discussed.

We have designed a simple and functional Cartesian plane model with the axes in high relief and secondary axes in low relief. The goal is that the student can perceive tactically what the sighted student can observe on a graph paper.

This model has multiple possibilities to elaborate concepts for the teachers, the blind students, the classmates and the family. It allows all to participate in the learning of basic mathematical concepts. The use of the Cartesian plane gives independence to the blind student allowing the student to study and complete the assigned work individually.

The Department of Mathematics at the University of Puerto Rico has a course of Adapted Mathematics for blind and visually impaired students. Its goal is to develop math skills in the mathematics courses for teachers, MATE3041 and MATE 3042 adapted for blind and visually impaired students who specialize in the area of mathematics for special education.

The use of different adapted materials is emphasized to aid in the teaching of mathematics to blind students such as the Cartesian plane in high and low relief, the Cranmer abacus, the use of tactile geometric figures and tools and how to write mathematics in Braille.

We seek to have a class environment with a real integration in education and offer the student with visual impairments the opportunity to become a part of an academic community in equality of conditions, respecting the differences, helping them develop the abilities that will allow them to relate in a natural way to their social world.

Physics and Astronomy are Inclusive

By: Wanda Diaz Merced and Dr. Carmen Pantoja

A year ago radio-astronomer Dr. Carmen Pantoja did not hesitate to agree to establish an educational project at the astronomy laboratory of the Physics Department at the University of Puerto Rico. The purpose of this project is to motivate students, at different levels to pursue careers in science. The project has been named on behalf of Shirohisa Ikeda a young man that was impaired due to a genetic disease, loved astronomy and died at young age. The project took form, and is now concentrating in the creation and adaptation of tactile lessons in astronomy for the blind, sonification of data, visits to schools and making physics and math inclusive.

A lesson to calculate the mass of a spiral galaxy using a tactile exploration of the HI spectrum has been designed using a wooden tactile cartesian plane designed by Ms. Gloria Maria Isidro, a graduate student of mathematics at the UPR. The spectrum is reproduced at the same scale on the tactile cartesian plane which facilitates the exploration. For students beginning to familiarize themselves with the concept of a galaxy the lesson makes use of three astronomy tactile books: "Touch the Stars" and "Touch the Universe", written and illustrated by Noreen Grice and "Our Place in Space", written and illustrated by David Hurd and John Matelock. Through tactile explorations these books facilitate the presentation of the concepts of galaxies and of spiral galaxies.

The Project is also seeking to sonify the HI spectrum (that is to assign a sound to a data stream) to hear the sonified data and do the tactile exploration at the same time. The NASA Radio-Jove double dipole radio telescope and audification receiver together with the NASA X-sonify software has made possible for the blind users to listen to the sounds of Solar Bursts and then sonify the data (<http://ltp.upr.clu.edu/astrolab/radiojove/SolarBurst.html>). X-sonify is a sonification software created by Robert Candey and Anton Schertenleib at NASA GSFC. The program has its own voice synthesizer giving independence to the blind user and allows the user to study data from different NASA satellites. The users

Physics and Astronomy are Inclusive

Continued from page 2.

at the Shirohisa Ikeda Project have used data from the GOES and WIND satellites.

Last year the participants presented the poster "Detection and Analysis of Plasma Bubbles at 20 Mhz", work done together with Dr. John Manone (<http://ltp.upr.clu.edu/astrolab/braille/juniortech.html>). The data was gathered using the radio JOVE 20 MHz double dipole and reduced using the exel program which was used with the voice synthesizer, facilitated by Dr. Lucy Torres of the Law 51 Lab at UPR.

Sixth graders at the Higinio Figueroa Villegas School, located at Maunabo Puerto Rico, are being taught to assemble the NASA Radio JOVE double dipole by one of the blind students participating of the project, Ms. Wanda Díaz. The Shirohisa Ikeda Project has been established in this school and the kids show a lot of enthusiasm. The experience in this school helps to make the project more inclusive since the sixth grade group has regular students and students from the special education program as well.

We are currently working in the development of a tactile lesson about the Sun. It will include an exploration of a sun-burst and the students will use the data to calculate its flux density. This work takes place at the Astronomy Laboratory at the UPR and we also sponsor the Telescopium Astronomical Society in which students meet every Wednesday night to learn about astronomy.



The Standard Touch: Developing Enriching Space Science E/PO Products for Learners who are Blind/Visually Impaired

Proposal submitted to Initiative to Develop Education through Astronomy and Space Science, 2005

Space science concepts are exciting and adventurous for learners of all ages. Today's technology provides access to previously abstract concepts. For learners who are blind/visually impaired (B/VI), the challenge is a bit greater. Through this project, a set of standards for accessible Braille space science materials will be developed to complement the current codes and standards for Braille, providing access to materials that teach space concepts to this group of learners. To address the needs of blind and visually impaired communities, and to promote their participation in space science, our team proposes to meet the following goals: 1) Increase the awareness of Education and Public Outreach (E/PO) professionals working on NASA missions about the needs of persons who are B/VI and 2) enable learners who are B/VI to experience the excitement of space science concepts and discoveries through NASA missions. We will: 1) Hold meeting of key professionals (B/VI experts, Braille, Tactile Graphics); 2) Develop a document that provides: a) Standards for creating Braille and tactile graphics using space science concepts, b) Guidelines for making space science digital media rich and meaningful for persons who are B/VI and c) Provide a list of key resources; 3) Identify common space science concepts; 4) Using key space science concept ideas create several examples for use by E/PO professionals and K-12/Informal educators; and 5) Disseminate document and examples through existing networks (including NFB, NASA CORE and NASA's Space Science E/PO Support Network).

The proposal, "The Standard Touch," was submitted to the Initiative to Develop Education through Astronomy and Space Science Program on behalf of Kathryn Guimond (PI—SERCH), Bernhard Beck-Winchatz (Co-I—DePaul), Jim Allan (Texas School for the Blind and Visually Impaired), Cynthia Atkinson (SERCH), and Lucia Hasty (Braille Authority of North America, BANA/Canadian Braille Authority and National Braille Association). If this project is awarded, TTFG members will be key collaborators and participants in developing "The Standard Touch" document.

ABOUT TTFG...

Due to the increased number of persons working specifically with space & Earth science content to develop tactile graphics and technology programs for persons who are blind/visually-impaired the Special Needs Resource Group (SNRG pronounced "synergy"), along with colleagues working in this particular field, created a focus subgroup named the *Tactile and Technology Focus Group (TTFG)*. By forming this group we hope to eliminate duplication of products, enhance the creation of new products and centralize products that are and will be created. It is our belief that by coalescing this highly innovative group and the products they create the group will provide a quality resource for educators of and to persons who are blind/visually-impaired.

As a first step, TTFG will release quarterly newsletters highlighting what members of the group are doing and developing for persons who are blind/visually-impaired. We hope you enjoy this newsletter and find it a useful resource.

For more information on TTFG or to join contact us @:

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**To join the Tactile and
Technology Focus Group
(TTFG) please send an
email with your name,
organization and email
to exceptional@cofc.edu.**