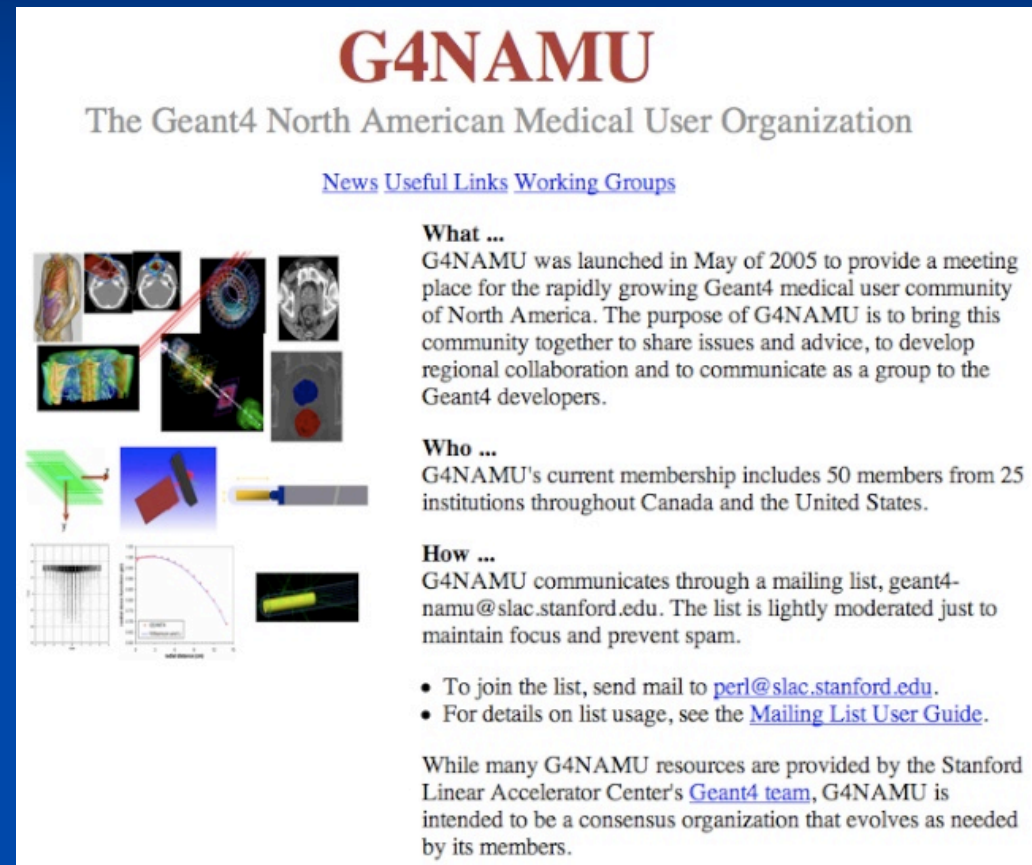


# Geant4 North American Medical Users Organization - G4NAMU

Launched in May of 2005 to provide a meeting place for the rapidly growing Geant4 medical user community of North America

- Bring this community together to share issues and advice, to develop regional collaboration and to communicate as a group to the Geant4 developers.
- Current membership includes 52 members from 27 institutions throughout Canada and the United States

<http://geant4.slac.stanford.edu/g4namu/>



**G4NAMU**  
The Geant4 North American Medical User Organization

[News](#) [Useful Links](#) [Working Groups](#)

**What ...**  
G4NAMU was launched in May of 2005 to provide a meeting place for the rapidly growing Geant4 medical user community of North America. The purpose of G4NAMU is to bring this community together to share issues and advice, to develop regional collaboration and to communicate as a group to the Geant4 developers.

**Who ...**  
G4NAMU's current membership includes 50 members from 25 institutions throughout Canada and the United States.

**How ...**  
G4NAMU communicates through a mailing list, [geant4-namu@slac.stanford.edu](mailto:geant4-namu@slac.stanford.edu). The list is lightly moderated just to maintain focus and prevent spam.

- To join the list, send mail to [perl@slac.stanford.edu](mailto:perl@slac.stanford.edu).
- For details on list usage, see the [Mailing List User Guide](#).

While many G4NAMU resources are provided by the Stanford Linear Accelerator Center's [Geant4 team](#), G4NAMU is intended to be a consensus organization that evolves as needed by its members.

The slide features a central collage of medical and scientific images, including CT scans, MRI scans, and various diagrams related to particle physics and medical imaging.

# Membership

G4NAMU's current membership includes 52 members from 27 institutions throughout Canada and the United States.

Current subscribers to the mailing list (page 1 of 3):

- SLAC: Joseph Perl, Makoto Asai
- Harvard & Mass General: Harald Paganetti, Xing-Qi Lu , Roelf L. Slopsema
- UCSF: Bruce Faddegon, Inder Daftari
- ULaval: Jean-François Carrier, Luc Beaulieu, Louis Archambault, Vincent Hubert Tremblay
- CHUQ: Luc Gingras
- UPenn: Steven Avery , Dickson Goulart, Jim McDonough
- Stanford: Todd Pawlicki, Gary Luxton, Lei Xing
- Louisiana State University: Blair Smith
- Fox Chase: Charlie Ma, Jiajin Fan, Jinsheng Li
- (continued on next slide...)

# Membership (continued)

Current subscribers to the mailing list (continued):

- McGill: Emily Poon, Frank Verhaegen, Jan Seuntjens
- Triumpf: Peter Gumplinger, Frederick Jones
- Memorial Sloan-Kettering: C. Ross Schmidlein, Assen Kirov, Sadek Nehmeh, Christopher Danford
- Johns Hopkins: Jingyan Xu
- University of Arkansas: Hongyu Jiang
- Jefferson Lab: Paul Gueye, Stan Majewski, Mark Smith, David Hamlette, Michael Epps, Marion MacCormic
- Advanced Laser Light Source: Jean-Claude Kieffer, Jean-Philippe Moreau
- University of Wisconsin – Madison: Hazim A Jaradat
- INRS: Francois Vidal, Sylvain Fourmaux, Ludovic Lecherbourg, Rémy Toth
- Université de Sherbrooke: Daniel Houde
- (continued on next slide...)

# Membership (continued)

Current subscribers to the mailing list (continued):

- University of Alberta: Robert Fedosejev, Craig Unick
- Walter Reed Army Medical Center: Dan Fry
- Texas A&M: Yong Chen
- University of Washington: Ruth Schmitz
- Hopital Maisonneuve-Rosemont: Brigitte Reniers
- University of Minnesota: Lihong Qin
- Xoft Inc.: Steve Axelrod

# G4NAMU within the World Geant4 Collaboration

- Of course all Geant4 users are part of a world wide community.
  - Medical Applications forum and other user forums are available for discussion and exchange, as well as other Geant4 workshops and meetings.
- But regional efforts also have a role.
  - In Europe, many efforts have been organized, particularly through Maria Grazia Pia of INFN
  - In Japan, many efforts has been organized through Takashi Sasaki of KEK (including carbon beams, parallel computing)
  - In North America, there has been no similar effort at regional organization

# G4NAMU as Regional Voice

- G4NAMU can serve as voice of the North American Geant4 Medical User community
  - Organize regional workshops or tutorials
  - Foster nearby collaborations
  - Speak with a collective voice to regional funding agencies
  - Meet regional certification needs
    - At its meeting last month in San Diego, the American Nuclear Society (ANS) recognized the formation of a Computational Medical Physics Working Group (CMPWG). CMPWG will be hosted by three divisions of ANS - Mathematics and Computations (M&C), Biology and Medicine (BMD), Radiation Protection and Shielding (RPSD).
    - CMPWG may become involved in benchmarking codes for Medical Physics applications.

# How Does G4NAMU Work

- We've agreed to use a mailing list.
  - [geant4-namu@slac.stanford.edu](mailto:geant4-namu@slac.stanford.edu)
  - The list is lightly moderated just to maintain focus and prevent spam.
  - To join the list, send mail to [perl@slac.stanford.edu](mailto:perl@slac.stanford.edu).
- We will have periodic meetings and will try, as we have today, to take advantage of existing meetings.
- We can go beyond this:
  - Provide workshops or tutorials
  - Develop additional Geant4 examples
  - Certify certain parts of the code for use in our communities
  - Collect requirements for Geant4 developers

# First In-Person Meeting

- Side meeting at the annual meeting of the American Association of Physicists in Medicine (AAPM) at Seattle in July 2005.
  - Strong interest (over 40 attendees)
  - Organized by
    - Steven Avery - University of Pennsylvania
    - Paul Gueye - Hampton University/JLAB
    - Harald Paganetti - Harvard/ Massachusetts General
    - Joseph Perl - SLAC
- Many next step suggested at the meeting (see following page).
- Notes at: <http://geant4.slac.stanford.edu/g4namu/aapm2005>
- Strong interest in medical tutorials in US:
  - Geant4 Tutorial with Medical, Space and High Energy examples to be held at SLAC March 7-11 2006
  - G4NAMU side meeting to be either March 6 or March 12.
  - Another tutorial to be held at JLab, Virginia, late April or May 2006



# Some Next Steps

- Improve communication between Geant4 developers and the medical physics community.
- Collect requirements for Geant4 developers.
- Validation:
  - Clarify what studies have been done, what results have been found, what studies still need to be done.
  - Perform additional beam tests as needed.
  - Compare cross sections used by Geant4 with those used by other MC codes in Medicine.
- Calculation speed:
  - Understand issues.
  - Suggest and validate variance reduction methods.
- Create additional medical examples.
- Continue discussion on the mailing list. Invite additional colleagues to the list.
- Maintain Relationships with Relevant North American Professional Organizations:
  - ANS Computational Medical Physics Working Group (CMPWG). They have asked Harald Paganetti to represent Geant4.
  - AAPM Task Group No. 105: "Guidance report on clinical implementation of the Monte Carlo method in external beam radiation therapy treatment planning."
- Work on ways to improve funding for Geant4 medical work in North America.

# Some Next Steps

- Develop the G4NAMU web site:
  - Should answer question: Why would I use Geant4 for medical physics?
  - Clarify which physics lists are recommended for which medical problems.
  - Provide a medical physicist's overview of each Geant4 release's release notes. I.e., what should a medical physicist know about this new release.
  - Collect references to papers.
    - For those papers that are publicly available, include actual copies of the papers.
    - For those papers that are restricted by subscriber permissions, include abstract and then link to actual publication (which not all viewers will be able to actually read).
  - Show Geant4 results in three sections:
    1. Where is Geant4 known to give good results? Link to appropriate publications.
    2. Where is Geant4 known to give poor results? Link to appropriate publications. Include discussion known problems and of what is planned to improve these issues.
      - n Where are Geant4 results unknown? I.e., what additional tests do we know we need to perform?
  - Show member names by work area.
- Hold tutorials aimed at medical users.
  - SLAC, early March 2006, details to be announced
  - Jefferson Lab, later in 2006, details to be announced
  - Smaller tutorials annually as part of AAPM annual meeting