

# Stanford Linear Accelerator Center



## Closing remarks

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Geant4 Tutorial Course @ Fermi Lab

October 29<sup>th</sup>, 2003

# Geant4

# Contents

- ▶ User support processes in Geant4
- ▶ Release plan

# User Support

- ▶ Geant4 Collaboration offers extensive user supports.
  - ▶ Users workshops
  - ▶ Tutorial courses
  - ▶ HyperNews and mailing list
  - ▶ Bug reporting system
  - ▶ Requirements tracking system
  - ▶ Daily “private” communications
  - ▶ New implementation - Technical Forum

# Geant4 users workshop

- ▶ Users workshops were held or are going to be held hosted by several institutes for various user communities.
  - ▶ KEK - Dec.2000, Jul.2001, Mar.2002, Jul.2002, Mar.2003, Jul.2003
  - ▶ SLAC - Feb.2002
  - ▶ Spain (supported by INFN) - Jul.2002
  - ▶ CERN - Nov.2002
  - ▶ ESA - Jan.2003, Jan.2004 (planned)
    - ▶ dedicated to space-related users
  - ▶ Helsinki - Oct.2003
  - ▶ Local workshops of one or two days were held or are planned at several places.

# Geant4 tutorials / lectures

- ▶ In addition to the users workshops, many tutorial courses and lectures with some discussion time slots were held for various user communities.
  - ▶ CERN School of Computing
  - ▶ Italian National School for HEP/Nuclear Physicists
  - ▶ MC2000
  - ▶ MCNEG workshop
  - ▶ IEEE NSS/MIC
  - ▶ KEK, SLAC, DESY, FNAL, INFN, Frascati, Karolinska, GranSasso, etc.
  - ▶ ATLAS, CMS, LHCb
  - ▶ Tutorials/lectures at universities
    - ▶ U.K. - Imperial
    - ▶ Italy - Genoa, Bologna, Udine, Roma, Trieste
- ▶ Geant4 collaboration is happy to offer tutorial courses if requested.

# HyperNews

- ▶ HyperNews system was set up in April 2001

[ [Membership](#) | [Subscriptions](#) | [Recent Index](#) | [Search](#) | [Geant4 Home](#) | [Feedback](#) | [Help](#) ]

## Geant 4

### Geant4 HyperNews Forums

#### **Welcome to the Geant4 HyperNews system.**

The Geant4 collaboration welcomes user participation in this forum through the exchange of questions about and experiences with the Geant4 toolkit. When possible, developers will monitor these contributions and provide assistance. To report a problem or program error please use the Geant4 Problem Reporting System.

The following list is a short guide to what you can do from this page:

- To read a forum, click on the title of the forum in one of the available indices. Available indices include a [Time Ordered Index](#), and a [Recent Post Index](#).
- To post a new message (start a new thread) in a forum, click on the **Add Message** button at the bottom of the forum page. One can also use [email](#).
- To create a membership, follow the directions [here](#).
- To edit your membership information in the system, go to the [Membership](#) page.
- To subscribe (once you are a member) to any forum or to see what forums you are currently subscribed to, go to the [Central HyperNews Subscription Page](#). You can also see who else is subscribed to a forum from there.
- To search the messages in the HyperNews system, go to the [HyperNews Search Page](#).
- To request a new forum be created, use the [Request a New Forum](#) page.

# HyperNews

- ▶ 19 categories
- ▶ Not only “user-developer”, but also “user-user” information exchanges are quite intensive.

## **Categorized Index of Forums**

[Control of runs, events, tracks, particles](#)

[Experimental Setup](#)

[General matters](#)

[Interfaces](#)

[Physics](#)

### **Control of runs, events, tracks, particles**

[Event and Track Management](#)

[Particles](#)

[Run Management](#)

### **Experimental Setup**

[Fields: Magnetic and Otherwise](#)

[Geometry](#)

[Hits, Digitization and Pileup](#)

### **General matters**

[Documentation and Examples](#)

[HyperNews System Announcements](#)

[Hypernews Testing](#)

[Installation and Configuration](#)

[User Requirements](#)

### **Interfaces**

[\(Graphical\) User Interfaces](#)

[Analysis](#)

[Persistency](#)

[Visualization](#)

### **Physics**

[Electromagnetic Processes](#)

[Fast Simulation, Transportation & Others](#)

[Hadronic Processes](#)

[Physics List](#)

# HyperNews is quite active

## Event and Track Management

This forum is a discussion of steps, tracks, events and the event manager.

+ Messages Inline Depth:  0  1  All  Outline Depth:  1  -1  +1  All

- 102. [Track leaving mother volume](#) by *Andreas*, 8/20/03 **NEW**
  - 1. [Re: Track leaving mother volume](#) by *Michel Maire*, 8/20/03 **NEW**
- 101. [tracking/analyzing deStep info on one entire run](#) by *David*, 8/11/03
  - 1. [Re: tracking/analyzing deStep info on one entire run](#) by *Makoto Asai*, 8/11/03
    - 1. [Re: tracking/analyzing deStep info on one entire run](#) by *David*, 8/11/03
    - 2. [Re: tracking/analyzing deStep info on one entire run](#) by *David*, 8/18/03 **NEW**
      - 1. [Re: tracking/analyzing deStep info on one entire run](#) by *Michel Maire*, 8/20/03 **NEW**
- 100. [How to get the name of the volume a track is in?](#) by *Mark Polsen*, 8/09/03
  - 1. [Re: How to get the name of the volume a track is in?](#) by *Makoto Asai*, 8/09/03
  - 2. [Re: How to get the name of the volume a track is in?](#) by *Mark Polsen*, 8/11/03
- 99. [Howto make G4Track information persistent?](#) by *Mark Polsen*, 8/06/03
  - 1. [Re: Howto make G4Track information persistent?](#) by *Makoto Asai*, 8/09/03
- 98. [Track Length of Primary Particle](#) by *turbo*, 8/05/03
  - 1. [Re: Track Length of Primary Particle](#) by *Michel Maire*, 8/05/03
- 97. [How to stop secondary particles?](#) by *Lei Zhu*, 8/04/03
- 96. [Final particle energy access from G4Trajectory](#) by *Danek Kotlinski*, 8/03/03
- 95. [Cerenkov process](#) by *Megan Lehnherr*, 7/30/03
  - 1. [Re: Cerenkov process](#) by *Peter Gumpfinger*, 7/30/03
  - > [Re: Cerenkov process](#) by *Megan Lehnherr*, 7/31/03
  - > [Re: Cerenkov process](#) by *Peter Gumpfinger*, 8/01/03
- 94. [TrackingManager](#) by *Vinzenz Bildstein*, 7/30/03
  - 1. [Re: TrackingManager](#) by *Takashi Sasaki*, 8/03/03
- 93. [CT Simulation](#) by *Lei*, 7/18/03
  - 1. [Re: CT Simulation](#) by *Vladimir IVANTCHENKO*, 7/18/03
- 92. [How to see if a track will intersect a volume before throwing it?](#) by *Andrew Hoover*, 7/14/03
  - 1. [Re: How to see if a track will intersect a volume before throwing it?](#) by *Makoto Asai*, 7/14/03
- 91. [G4Step and Total Energy Deposition](#) by *Bob Weller*, 6/26/03
  - 1. [Re: G4Step and Total Energy Deposition](#) by *Vladimir Ivantchenko*, 6/27/03
- 90. [Killing primaries](#) by *m.j.carson@sheffield.ac.uk*, 6/25/03
  - 1. [Re: Killing primaries](#) by *Makoto Asai*, 6/25/03
- 89. [How to gain the position of the particle by using G4Track](#) by *chen yong*, 5/26/03
  - 1. [Re: How to gain the position of the particle by using G4Track](#) by *Vladimir IVANTCHENKO*, 5/26/03
- 88. [G4VUserTrackInformation is broken \(or at least VERY fragile\)](#) by *Tom Roberts*, 5/20/03
  - 1. [Re: G4VUserTrackInformation is broken \(or at least VERY fragile\)](#) by *Makoto Asai*, 5/20/03
- 87. [Question on name of produced nucleon](#) by *Alexander Dietz*, 5/14/03
- 86. [Problems to access data on LCapture](#) by *Alexander Dietz*, 5/13/03
- 85. [How to end a track manually?](#) by *Dvorak*, 4/23/03
  - 1. [Re: How to end a track manually?](#) by *Vladimir IVANTCHENKO*, 4/23/03
    - 1. [Re: How to end a track manually?](#) by *Dvorak*, 4/23/03



# Some postings are novice...


More  Next  Prev.  Out 

## ? Where can I find the FORTRAN type source code of simulation?

Base: [Documentation and Examples](#)

Keywords: FORTRAN source code

Date: Thu, 13 Sep 2001 02:22:31 GMT

From: 

I am trying to find some source codes of FORTRAN type to learn to do my simulation work. But I do not know where they are because I am a novice of GEANT4.  
Please, help me.

More  Next  Prev.  Out 

+ Messages Inline Depth:  0  1  All Outline Depth:  1  -1  ...  +1  All

1. ☹ [Re: Where can I find the FORTRAN type source code of simulation?](#) by Makoto Asai, 9/13/01

Add Message 

to: "Where can I find the FORTRAN type source code of simulation?"

# Some are excellent users contribution

More  Next  Prev.  Out 

## 💡 Re: Clean abort of run

Base: [Run Management](#)

Re: [Clean abort of run](#)

Keywords: abort run

Date: Fri, 26 Jul 2002 10:05:24 GMT

From:

Hi Mario,

We had the same requirement for our project. The solution we found was to set-up a signal handler class: when the user sends a stop signal, this class aborts the run, then returns to the normal execution of the simulation. I've included a typical example of code below, and some comments at the end of this mail

prototypes:

-----

```
namespace MySignalHandler
{
    G4int Install(void);

    void QuitSignalHandler(int sig);
};
```

implementation:

-----

```
G4int MySignalHandler::Install()
{
    // Install the signal handler for SIGQUIT only
    if (signal(SIGQUIT,QuitSignalHandler) == SIG_ERR) {
        G4cerr << G4endl << "Warning! Could not install handler for CTRL-\\
```

# Technical Forum

- ▶ In the Technical Forum, the Geant4 Collaboration, its user community and resource providers discuss:
  - ▶ major user and developer requirements, user and developer priorities, software implementation issues, prioritized plans, physics validation issues, user support issues
- ▶ The Technical Forum is open to all interested parties
  - ▶ To be held at least 4 times per year (in at least two locales)
- ▶ The purpose of the forum is to:
  - ▶ Achieve, as much as possible, a mutual understanding of the needs and plans of users and developers.
  - ▶ Provide the Geant4 Collaboration with the clearest possible understanding of the needs of its users.
  - ▶ Promote the exchange of information about physics validation performed by Geant4 Collaborators and Geant4 users.
  - ▶ Promote the exchange of information about user support provided by Geant4 Collaborators and Geant4 user communities.
- ▶ First Technical Forum at TRIUMF in September 2003, followed by one at CERN in October 2003. We plan to have the third one in January 2004.

# Features planned for Geant4 6.0 - 1

- ▶ Geant4 version 6.0 release date: **December 12<sup>th</sup> 2003**
- ▶ General developments
  - ▶ Design and implementation of *weight-window* biasing
  - ▶ Analysis and design iteration for tallies
- ▶ Run, Event and Detector response
  - ▶ Design review of *G4RunManager* modularity
  - ▶ New entry methods of *G4EventManager* which directly take HepMC or track vector
  - ▶ Design iteration for event biasing and tallies
- ▶ Tracking, Track
  - ▶ Code review: code cleanup and improvements (Q/A, comments)
  - ▶ Improvement in performance & benchmarking
- ▶ Particle
  - ▶ Code cleanup
  - ▶ Eliminate 'cuts'

# Features planned for Geant4 6.0 - 2

- ▶ Geometry & Transportation
  - ▶ Design iteration & implementation
    - ▶ Design and prototype implementation of abstract navigation and transportation
    - ▶ Feasibility study for handling of specific overlapping support structures
    - ▶ Redesign of *G4Sphere* and tolerances for spherical/cylindrical surfaces
    - ▶ Division volumes for *G4Box*, *G4Tubs*, *G4Cons*, *G4Para*, *G4Trd*, *G4Polycone*, *G4Polyhedra*, *G4Sphere*
    - ▶ Implementation of specific twisted trapezoid shape
  - ▶ Enhancements
    - ▶ Reflection of parameterised volumes and divisions

# Features planned for Geant4 6.0 - 3

- ▶ Electromagnetic physics
  - ▶ Standard electromagnetic
    - ▶ New implementation of *Ionisation*, *Bremsstrahlung* and *Multiple Scattering* processes using a model approach
    - ▶ Specific implementation of *Multiple Scattering* for generic ions
    - ▶ Revision of the *Bremsstrahlung* process and implementation of the LPM effect in *Gamma Conversion* for processes above 10 TeV
    - ▶ New implementation of the *Synchrotron Radiation* process
    - ▶ New process for *optical photons* implementing a wave length shifting mechanism
    - ▶ Enhancements to the *Photoelectric Effect* process
    - ▶ Performance analysis and optimisation
  - ▶ Low Energy electromagnetic
    - ▶ Implementation of *Penelope* processes for electrons and positrons
    - ▶ New models of *Bremsstrahlung* angular distribution
    - ▶ New model of *PIXE*

# Features planned for Geant4 6.0 - 4

- ▶ Hadronic physics
  - ▶ Inclusion of light ion reactions into binary cascade
  - ▶ Inclusion of pion projectiles into binary cascades, extensions to the scattering term, and inclusion of absorption
  - ▶ Inclusion of light and heavy ion reactions into quark-gluon string model
  - ▶ Inclusion of recoils into elastic scattering
  - ▶ Design iteration for hadronic framework to allow for direct implementation of biasing at the framework level
  - ▶ Implementations of leading particle biasing and cross-section biasing
  - ▶ Completion of combined re-engineering of HETC and INUCL
  - ▶ Review of the pion and kaon reaction cross-sections
  - ▶ Reorganization of physical structure of modules

# Features planned for Geant4 6.0 - 5

- ▶ Visualisation & Graphics Representations
  - ▶ Remote visualization in the *GAIN* platform
  - ▶ Implementation of high-quality *DCUT* (slice picture) with the *DAWNFILE* driver
  - ▶ Extension of the *DAVID* tool to provide XML output and link to *WIRED*
  - ▶ Extension to *BooleanProcessor* for display of specific boolean solids setups
  - ▶ Visualization of field lines
  - ▶ Visualization of ghost and readout geometries
- ▶ User and Category Interfaces
  - ▶ Implement strategy for integrating Geant4 environment with external tools and frameworks (Python, SWIG, JACO, ...)
  - ▶ Evaluate requirements and issues for parallelism