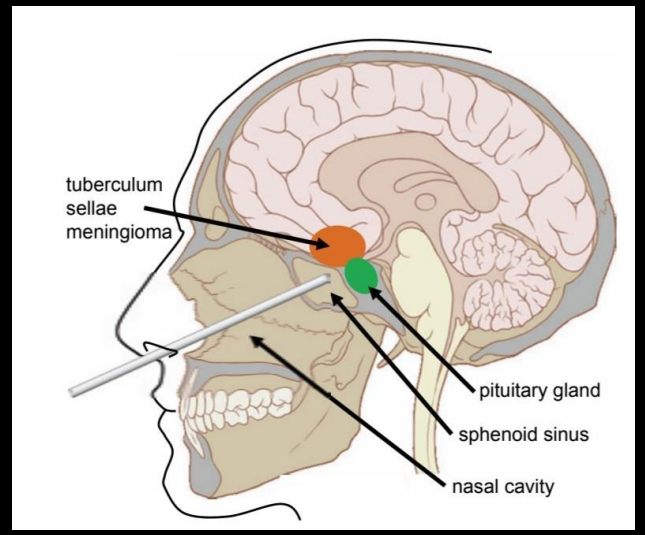
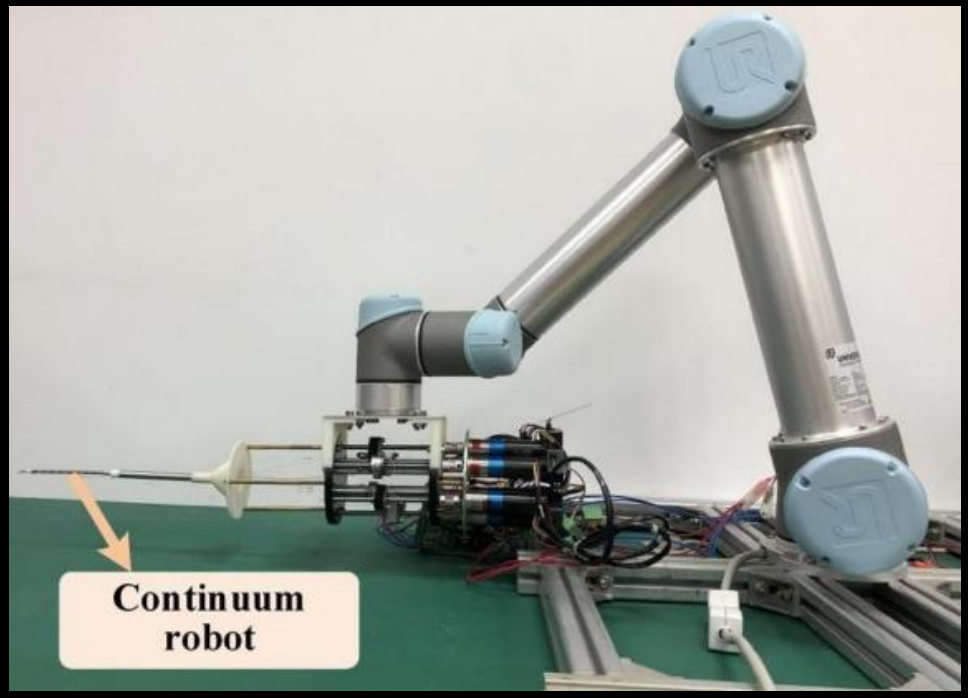
n_TOF & GEANT4

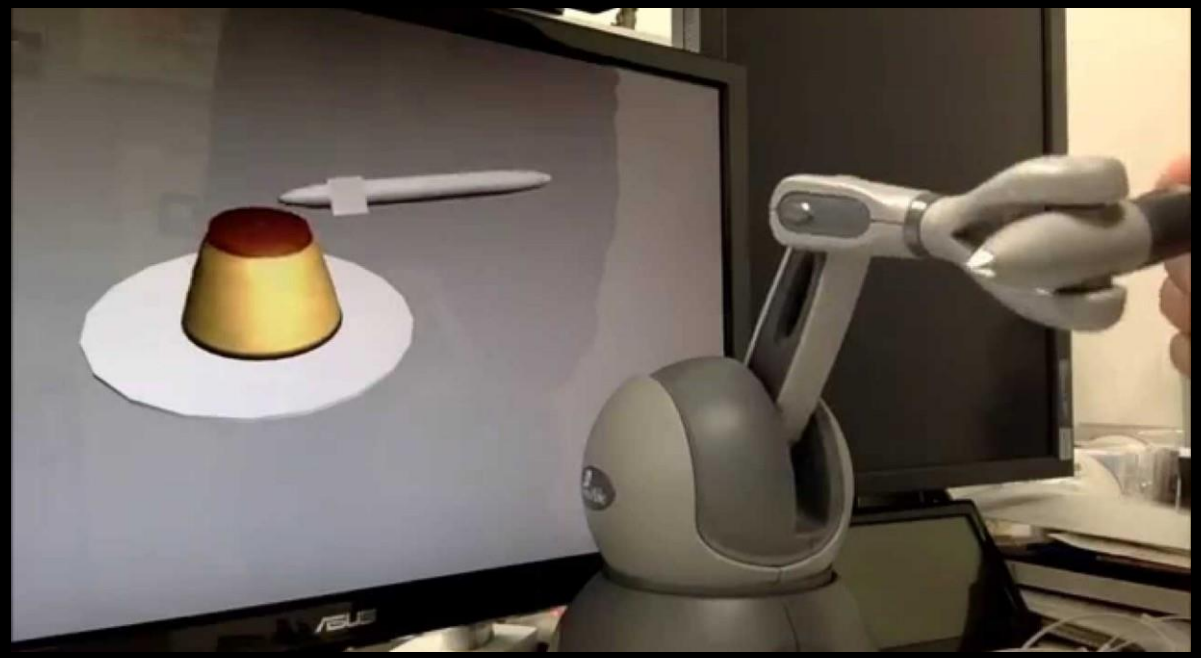
김수민

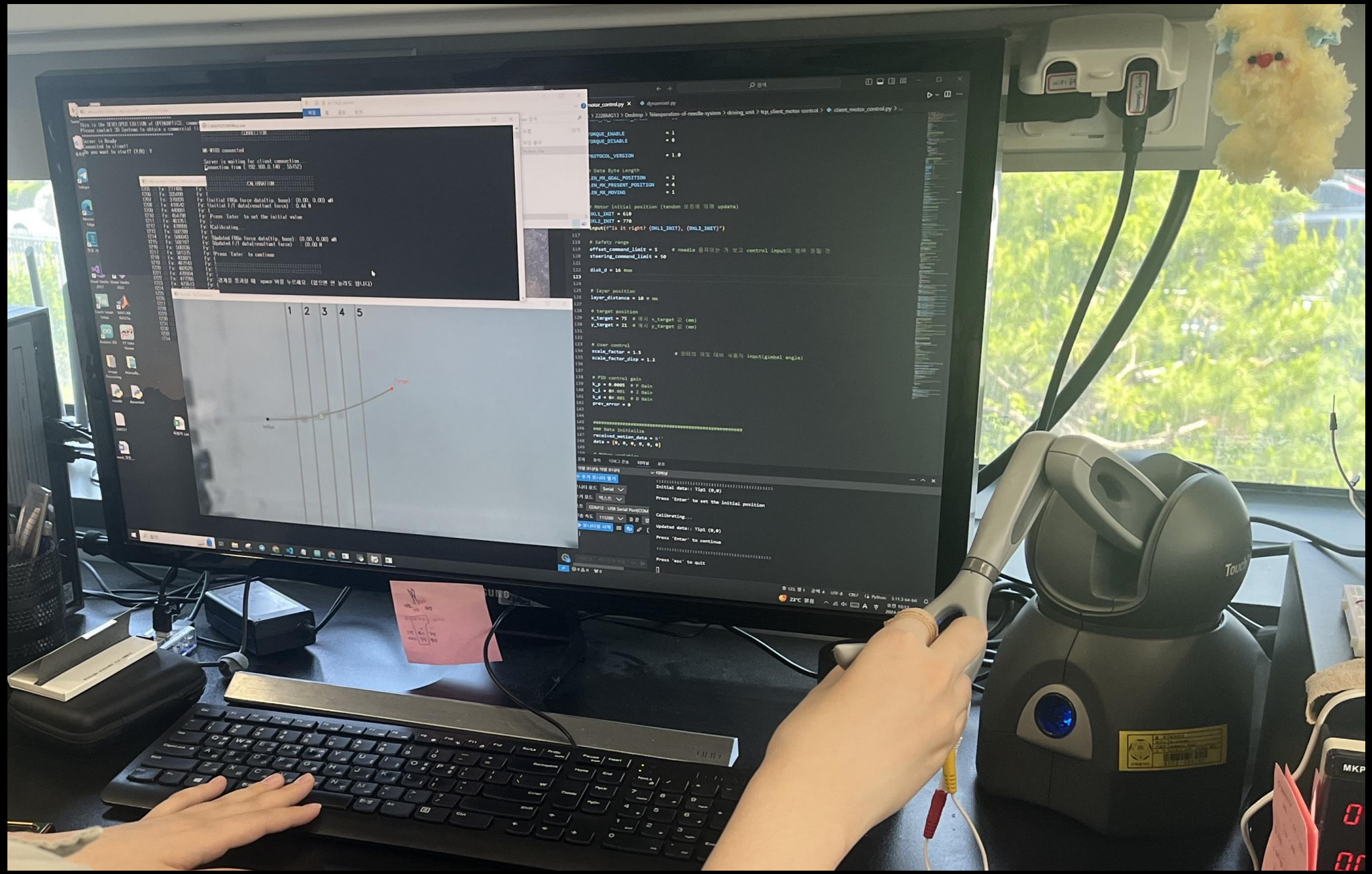
What I Used to Do



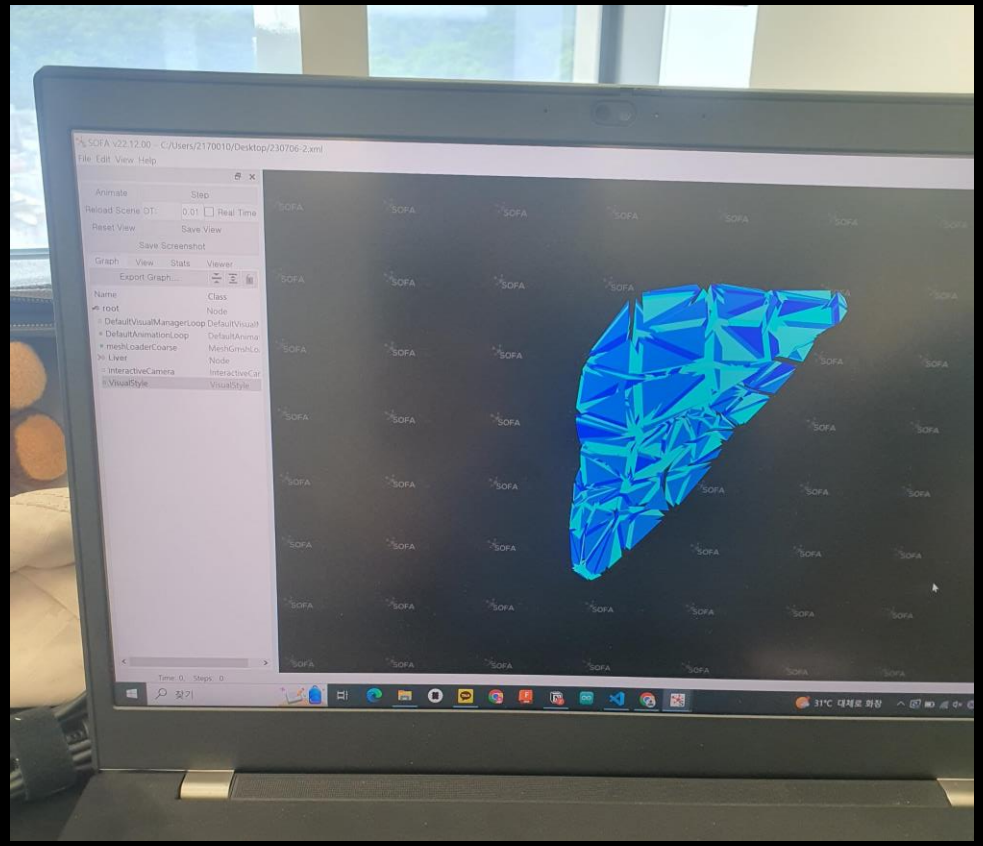


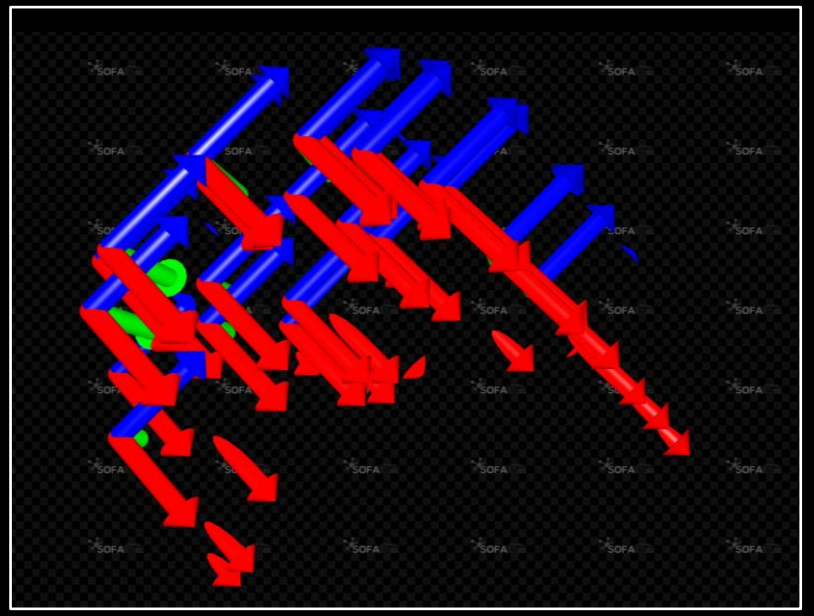
Haptic Device - PHANToM OMNI

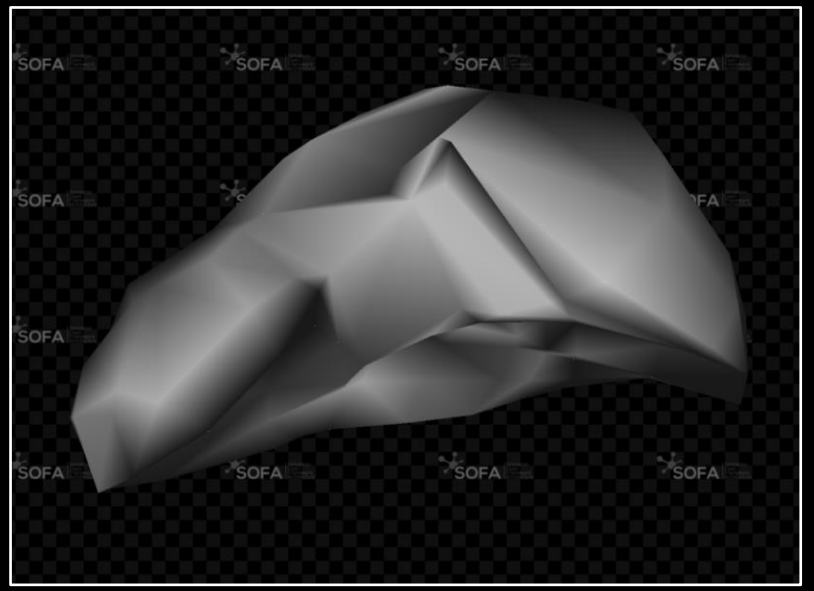



1 2 3 4 5
Target
Initial
Initial data:: Tip1 (0,0)
Press 'Enter' to set the initial position
Calibrating...
Updated data:: Tip1 (0,0)
Press 'Enter' to continue
Press 'esc' to quit

SOFA







```
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<Node name="Liver" >
  <EulerImplicitSolver />
  <CGLinearSolver iterations="200" tolerance="1e-09" threshold="1e-09" />
  <TetrahedronSetTopologyContainer name="topo" src="@../meshLoaderCoarse" />
  <TetrahedronSetTopologyGeometryAlgorithms template= "Vec3d" name= "GeomAlgo"/>
  <MechanicalObject template="Vec3d" name="MechanicalModel" showObject="1" />
  <TetrahedronFEMForceField name= "FEM" youngModulus= "1000" poissonRatio= "0.4" method= "polar" />
  <MeshMatrixMass massDensity= "1" />
  <ConstantForceField totalforce ="100 0 0" />
  <FixedConstraint indices= "1 3 50" />
  <Node name="Visual" >
    <OglModel name="VisualModel" src="@../../meshLoaderFine" />
    <BarycentricMapping name="Mapping" input="@../MechanicalModel" output="@VisualModel" />
  </Node>

  <Node name="Collision">
    <Mesh src="@../../meshLoaderFine"/>
    <MechanicalObject name="StoringForces" scale="1.0" />
    <TriangleCollisionModel name="CollisionModel" contactStiffness="3"/>
    <BarycentricMapping name="CollisionMapping" input="@../" output="@StoringForces" />
  </Node>

  <Node name="TriangularSurface" >
    <TriangleSetTopologyContainer name= "Container" />
    <TriangleSetTopologyModifier name= "Modifier" />
    <Tetra2TriangleTopologicalMapping input="@../topo" output= "@Container"/>
    <TriangleCollisionModel name="CollisionModel" contactStiffness="1"/>
  </Node>

</Node>
```

n_TOF

The neutron time-of-flight facility (n_TOF) studies neutron-nucleus interactions for neutron energies ranging from a few meV to several GeV

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

Proposal to the ISOLDE and Neutron Time-of-Flight Committee

Measurement of the Ta(n,γ) cross-section at EAR1

September 26, 2022

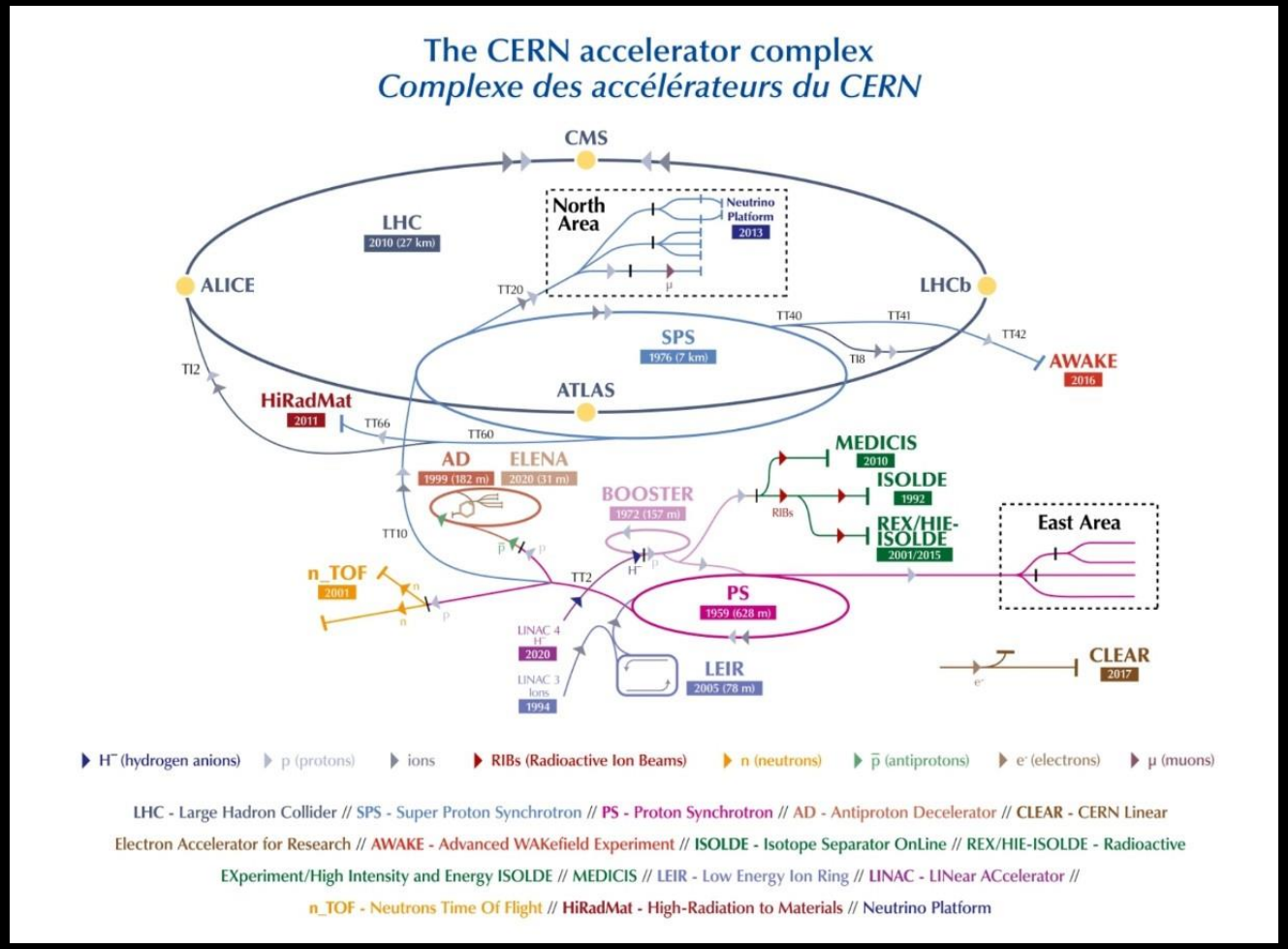
V. Alcayne[1], D. Cano-Ott[1], E. González-Romero[1], T. Martínez[1], E. Mendoza[1], A. Sánchez-Caballero[1], J. Balibrea-Correa[2], F. Calviño[3], R. Capote[4], A. Casanovas[3], C. Domingo-Pardo[2] and J. Lerendegui-Marco[2].

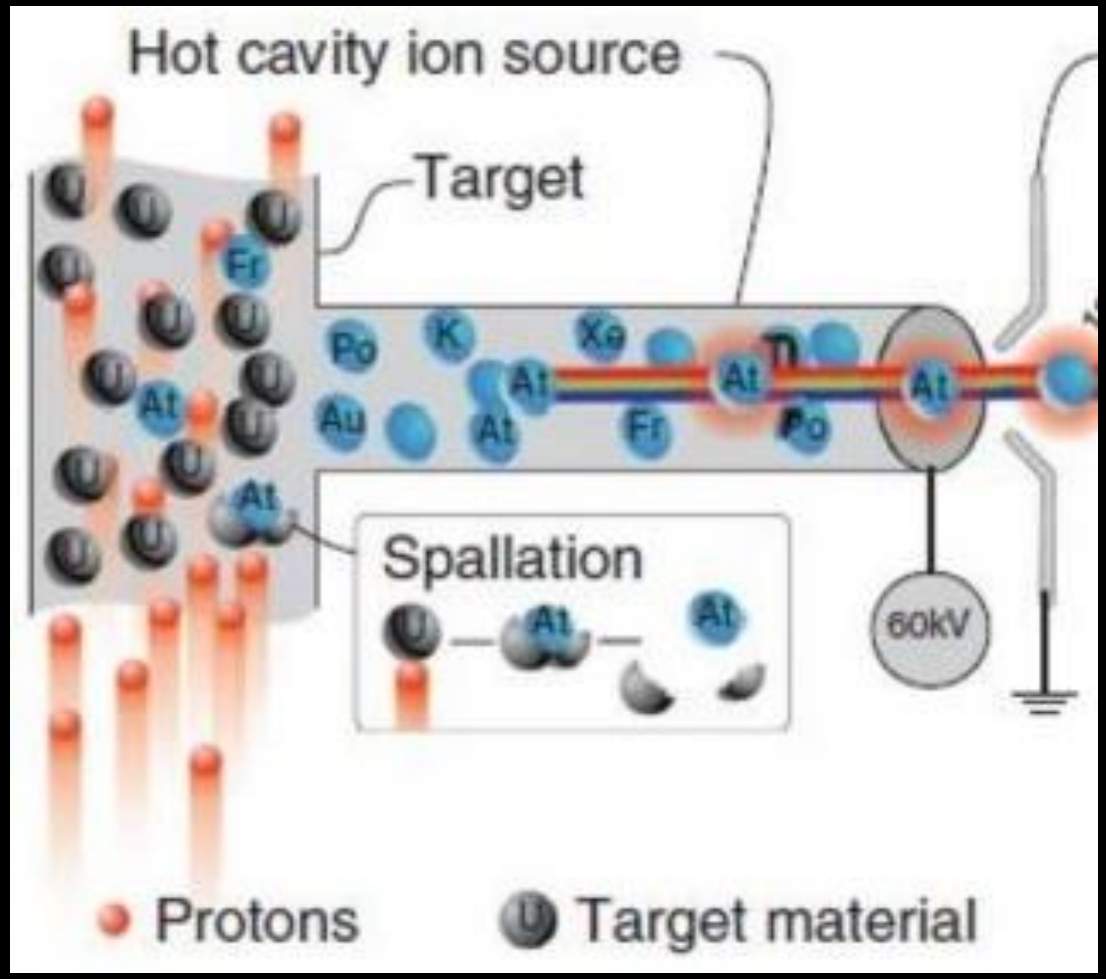
Review

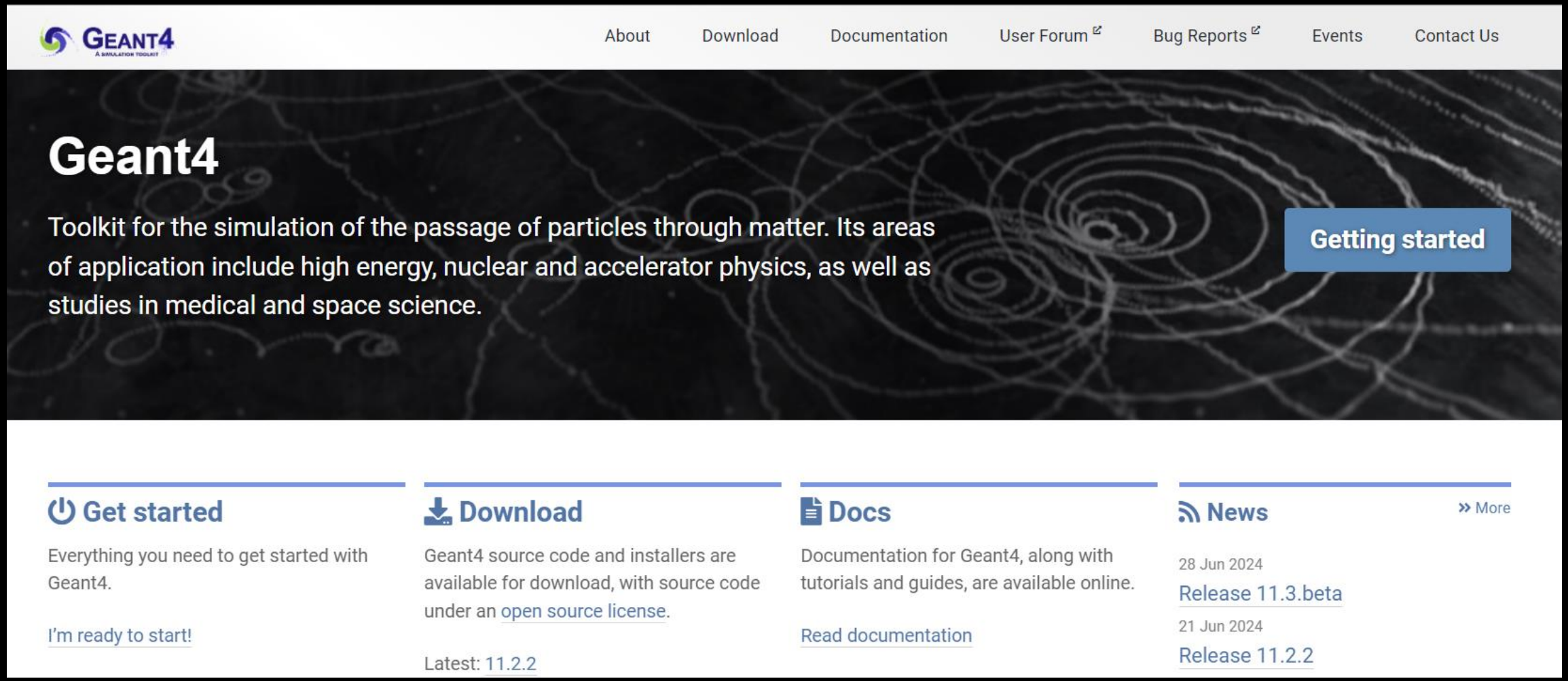
Theranostics in Boron Neutron Capture Therapy

Wolfgang A. G. Sauerwein [1,2,3,*], Lucie Sancey [4], Evamarie Hey-Hawkins [1,5], Martin Kellert [5], Luigi Panza [1,6], Daniela Imperio [1,6], Marcin Balcerzyk [7,8], Giovanna Rizzo [9], Elisa Scalco [9], Ken Herrmann [10], PierLuigi Mauri [1,11,12], Antonella De Palma [11] and Andrea Wittig [1,13]

n_TOF Spallation



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Geant4
Toolkit for the simulation of the passage of particles through matter. Its areas of application include high energy, nuclear and accelerator physics, as well as studies in medical and space science.
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28 Jun 2024
Release 11.3.beta
21 Jun 2024
Release 11.2.2

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First released 21 Jun 2024 **Old releases**

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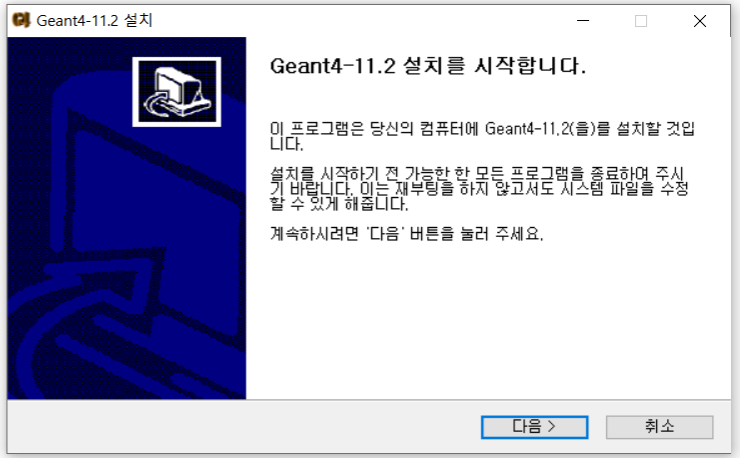
RELEASE NOTES

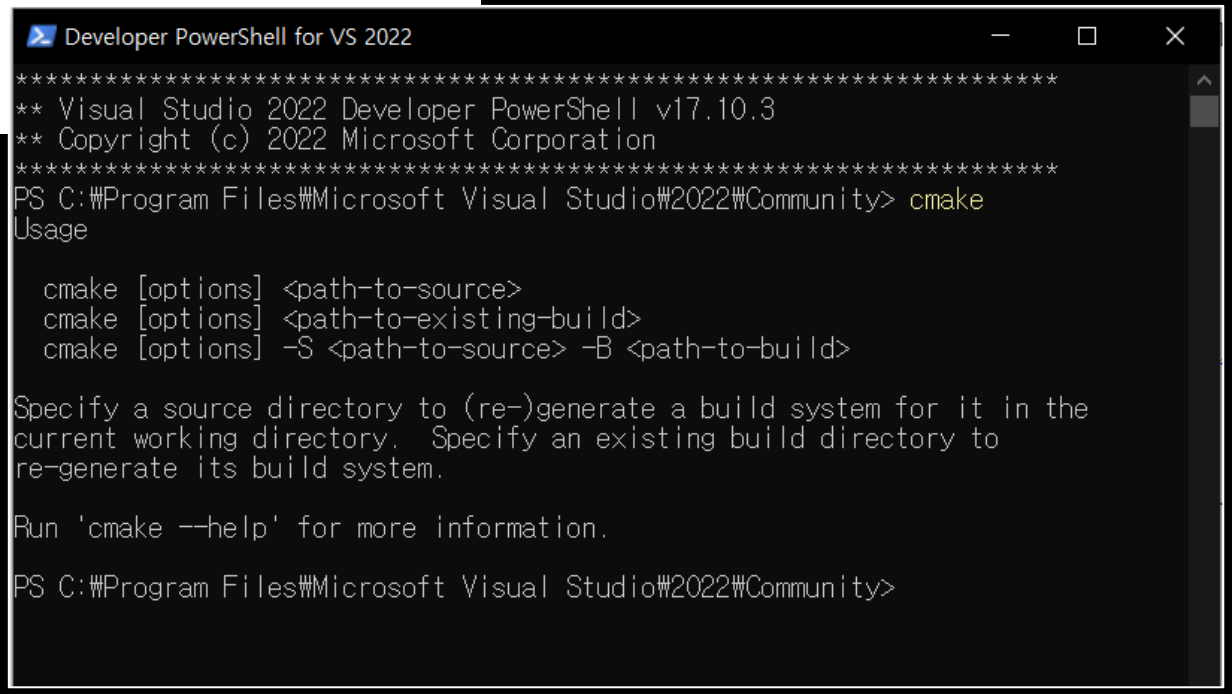
See:
Main Release Notes - Patch-1 - Patch-2 -

Source code

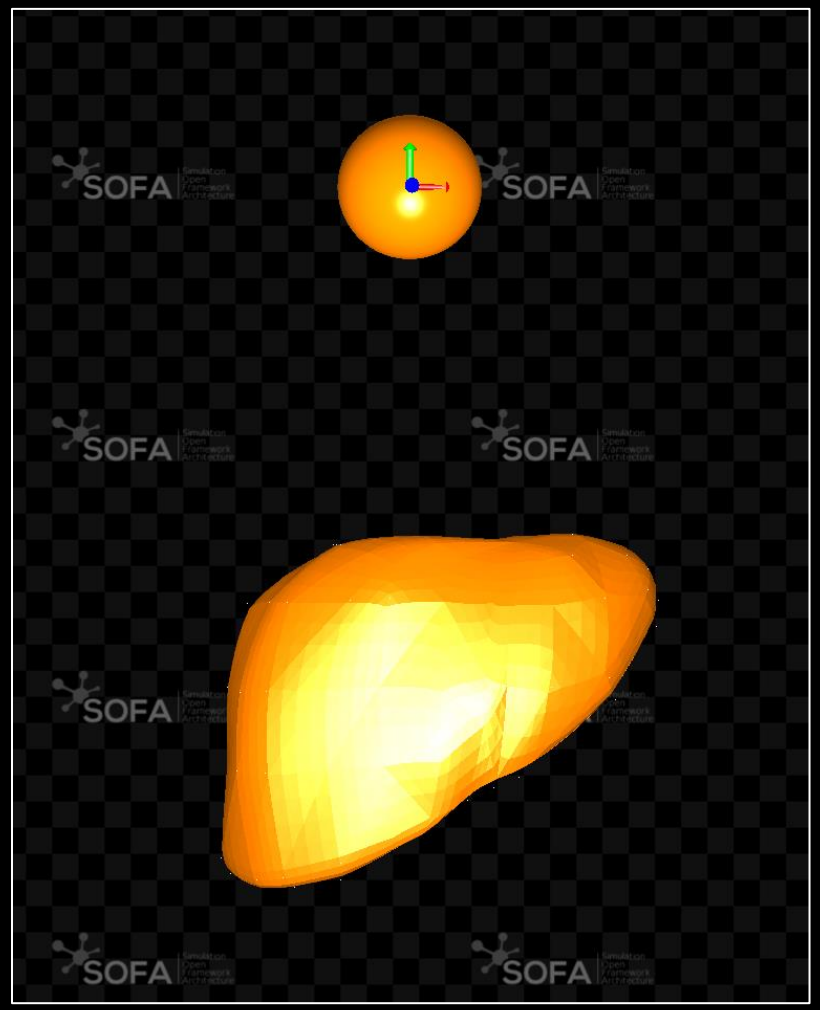
Source code is freely available from CERN GitLab or through GitHub.
Source code can also be browsed through the LXR source code browser.

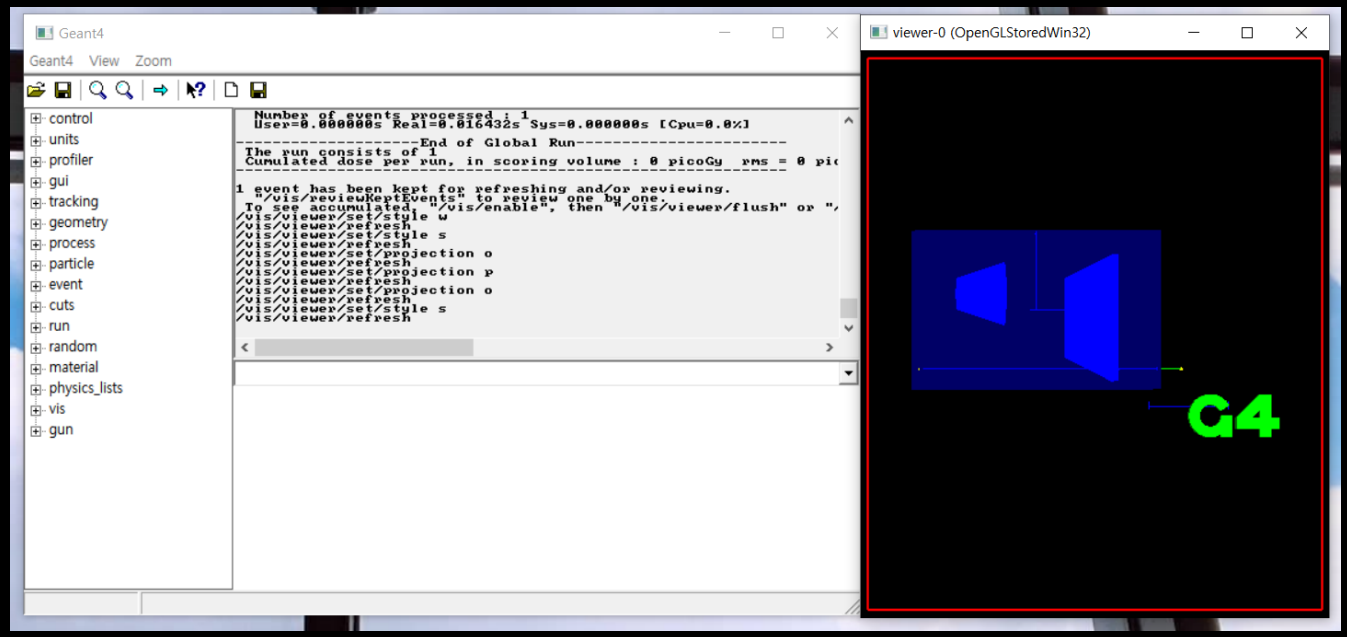
Download zip **Download tar.gz** **Download tar.bz2** **Download tar**

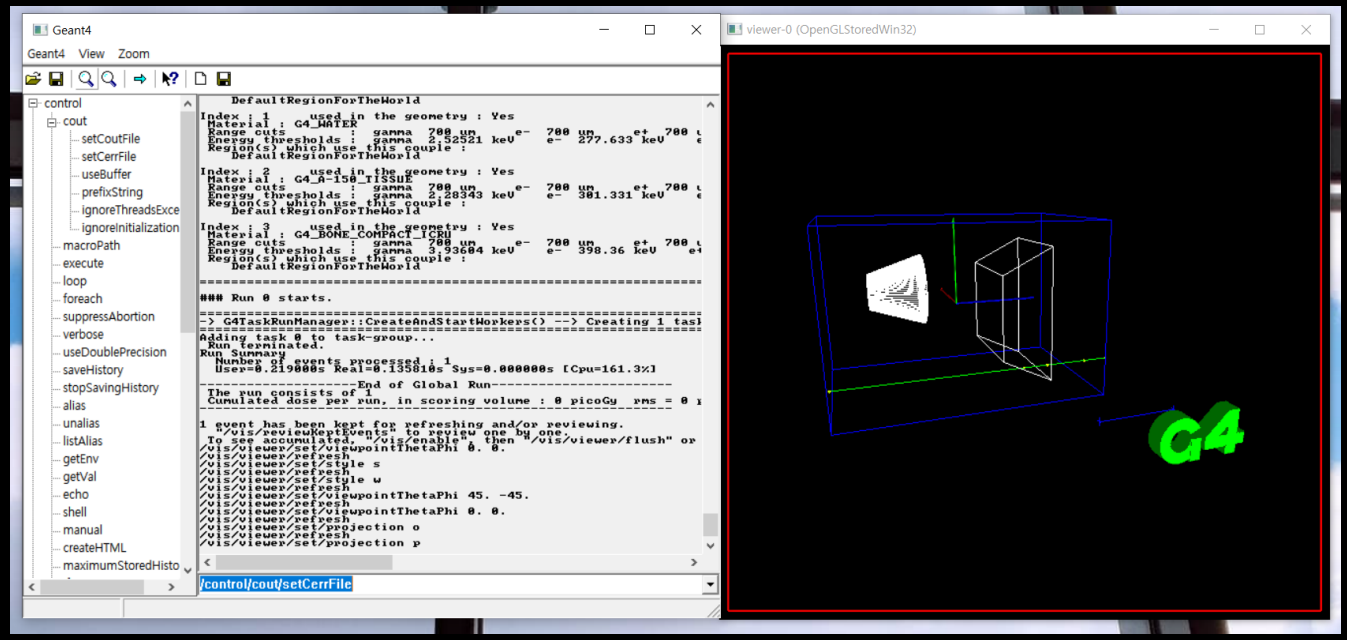




Multiple Objects







Creating Materials for Simulation

```
<MeshTopolgy name="meshLoaderfile" filename= "mesh/liver.???" />
<Node name="Liver" >
  <EulerImplicitSolver />
  <CGLinearSolver iterations="200" tolerance="1e-09" threshold="1e-09" />
  <TetrahedronSetTopologyContainer name="topo" src="@../meshLoaderCoarse" />
  <TetrahedronSetTopologyGeometryAlgorithms template= "Vec3d" name= "GeomAlgo"/>
  <MechanicalObject template="Vec3d" name="MechanicalModel" showObject="1" />
  <TetrahedronFEMForceField name= "FEM" youngModulus= "1000" poissonRatio= "0.4" method= "polar" />
  <MeshMatrixMass massDensity= "1" />
  <ConstantForceField totalforce ="100 0 0" />
  <FixedConstraint indices= "1 3 50" />
  <Node name="Visual" >
    <OglModel name="VisualModel" src="@../../meshLoaderFine" />
    <BarycentricMapping name="Mapping" input="@../MechanicalModel" output="@VisualModel" />
  </Node>
```

```
G4double z, a, fractionmass, density;
G4String name, symbol;
G4int ncomponents;

a = 14.01*g/mole;
G4Element* elN  = new G4Element(name="Nitrogen",symbol="N" , z= 7., a);

a = 16.00*g/mole;
G4Element* elO  = new G4Element(name="Oxygen"  ,symbol="O" , z= 8., a);

density = 1.290*mg/cm3;
G4Material* Air = new G4Material(name="Air  ",density,ncomponents=2);
Air->AddElement(elN, fractionmass=70*perCent);
Air->AddElement(elO, fractionmass=30*perCent);
```

IEEE TRANSACTIONS ON NUCLEAR SCIENCE, VOL. 61, NO. 4, AUGUST 2014 2357

New Standard Evaluated Neutron Cross Section Libraries for the GEANT4 Code and First Verification

Emilio Mendoza, Daniel Cano-Ott, Tatsumi Koi, and Carlos Guerrero on behalf of the GEANT4 collaboration

Monte Carlo simulations of the n_TOF lead spallation target with the Geant4 toolkit: A benchmark study

J. Lerendegui-Marco[1,a], M.A. Cortés-Giraldo[1], C. Guerrero[1], J.M. Quesada[1], S. Lo Meo[2,3], C. Massimi
M. Barbagallo[5], N. Colonna[5], D. Mancussi[6], F. Mingrone[7], M. Sabaté-Gilarte[7,1], G. Vannini[3,4], V. Vlach
O. Aberle[7], J. Andrzejewski[8], L. Audouin[9], M. Bacak[6,7,10], J. Balibrea[11], F. Bečvář[12], E. Berthoumieux[6], J
D. Bosnar[14], A. Brown[15], M. Caamaño[16], F. Calviño[17], M. Calviani[7], D. Cano-Ott[11], R. Cardella[7], A. Cas
F. Cerutti[7], Y.H. Chen[9], E. Chiaveri[1,7,13], G. Cortés[17], L. Cosentino[18], L.A. Damone[5,19], M. Diakaki[6], C. Dor
R. Dressler[21], E. Dupont[6], I. Durán[16], B. Fernández-Domínguez[16], A. Ferrari[7], P. Ferreira[22], P. Finocchiaro
M.B. Gómez-Hornillos[18], A.R. García[11], A. Gawlik[8], S. Gilardoni[7], T. Glodariu[24], I.F. Gonçalves[22], E. G
E. Griesmayer[10], F. Gunsing[6,7], H. Harada[25], S. Heinitz[21], J. Heyse[26], D.G. Jenkins[15], E. Jericha[10], F. Käppe
A. Kalamara[28], P. Kavrigin[10], A. Kimura[25], N. Kivel[21], M. Kokkoris[28], M. Krtička[12], D. Kurtulgil[23], E. Leal-Cidoncha[16],
C. Lederer[29], H. Leeb[10], S.J. Lonsdale[29], D. Macina[7], J. Marganiec[8,30], T. Martínez[11], A. Masi[7], P. Mas
M. Mastromarco[5], E.A. Maugeri[21], A. Mazzone[5,32], E. Mendoza[11], A. Mengoni[27], P.M. Milazzo[33], A. Mu
A. Negret[24], R. Nolte[30], A. Oprea[24], N. Patronis[35], A. Pavlik[36], J. Perkowski[8], I. Porras[37], J. Praena[37], D.
T. Rauscher[38,39], R. Reifarth[23], P.C. Rout[40], C. Rubbia[7], J.A. Ryan[13], A. Saxena[40], P. Schillebeeckx[26], D.
A.G. Smith[13], N.V. Sosnin[13], A. Stamatopoulos[28], G. Tagliente[5], J.L. Tain[20], A. Tarifeño-Saldivia[13], L. Ta
S. Valenta[12], V. Variale[5], P. Vaz[22], A. Ventura[28], R. Vlastou[28], A. Wallner[41], S. Warren[13], P.J. Woods[29], T.
P. Žugec[14,7], and the n_TOF Collaboration

Geant4 simulation of the n_TOF-EAR2 neutron beam: Characteristics and prospects

J. Lerendegui-Marco[1,a], S. Lo Meo[2,3], C. Guerrero[1], M.A. Cortés-Giraldo[1], C. Massimi[3,4], J.M. Quesada[1], M. Barbagallo[5], N. Colonna[5], D. Mancusi[6], F. Mingrone[3], M. Sabaté-Gilarte[1,6], G. Vannini[3,4], V. Vlachoudis[6], and the n_TOF Collaboration[7,b]

GEANT4 simulations of the n_TOF spallation source and their benchmarking

S. Lo Meo[1,2,a], M.A. Cortés-Giraldo[6], C. Massimi[2,3], J. Lerendegui-Marco[6], M. Barbagallo[4], N. Colonna[4], C. Guerrero[6], D. Mancusi[5], F. Mingrone[2], J.M. Quesada[6], M. Sabate-Gilarte[6,7], G. Vannini[2,3], V. Vlachoudis[7], and The n_TOF Collaboration[b]

EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

Letter of Intent to the ISOLDE and Neutron Time-of-Flight Committee

HPGe detector test at n_TOF: Feasibility study for neutron inelastic scattering measurements

May 3, 2021

M. Barbagallo[1,2], M. Diakaki[3], Z. Eleme[4], M. Kokko
N. Patronis[4], C. Petrone[6], M.E. Stamati[4], A. Sta
Tsinganis[9], R. Vlast

The CERN n_TOF NEAR station for astrophysics- and application-related neutron activation measurements.

N. Patronis[1,2], A. Mengoni[2,3], N. Colonna[40], M. Cecchetto[2], C. Domingo-Pardo[5], O. Aberle[2], J. Lerendegui-Marco[5], G. Gervino[6], M.E. Stamati[1], S. Goula[1], A.P. Bernardes[2], M. Mastromarco[4,41], A. Manna[7], R. Vlastou[8], C. Massimi[7,40], M. Calviani[2], V. Alcayne[9], S. Altieri[10], S. Amaducci[11], J. Andrzejewski[12], V. Babiano-Suarez[5], M. Bacak[2], J. Balibrea[5], C. Beltrami[10], S. Bennett[13], E. Berthoumieux[14], M. Boromiza[15], D. Bosnar[16], M. Caamaño[17], F. Calviño[18], D. Cano-Ott[9], A. Casanovas[18], F. Cerutti[2], G. Cescutti[19,20], S. Chasapoglou[8], E. Chiaveri[2], P. Colombetti[21], P. Console Camprini[7], G. Cortés[18], M. A. Cort´es-Giraldo[22], L. Cosentino[11], S. Cristallo[23,24], S. Dellmann[25], M. Di Castro[2], S. Di Maria[26], M. Diakaki[8], M. Dietz[27], R. Dressler[28], E. Dupont[14], I. Durán[17], Z. Eleme[1], S. Fargier[2], B. Fernández[25], B. Fernández-Dom´ınguez[17], P. Finocchiaro[11], S. Fiore[29], V. Furman[30], F. Garc´ıa-Infantes[31], A. Gawlik-Ramiega[12], S. Gilardoni[2], E. González-Romero[9], C. Guerrero[22], F. Gunsing[14], C. Gustavino[31], J. Heyse[33], W. Hillman[12], D. G. Jenkins[34], E. Jericha[35], A. Junghans[36], Y. Kadi[2], K. Kaperoni[8], G. Kaur[14], A. Kimura[37], I. Knapová[38], M. Kokkoris[8], Y. Kopatch[30], M. Krtička[38], N. Kyritsis[8], I. Ladarescu[12], C. Lederer-Woods[39], G. Lerner[2], T. Mart´ınez[9], A. Masi[2], P. Mastinu[41], E. A. Maugeri[28], A. Mazzone[43], E. Mendoza[9], P. M. Milazzo[19], R. Mucciola[23], F. Murtas[44], E. Musacchio-Gonzalez[41], A. Musumarra[45], A. Negret[15], A. P´erez de Rada[9], P. P´erez-Maroto[22], J. A. Pavón-Rodr´ıguez[22], M. G. Pellegriti[7], J. Perkowski[12], C. Petrone[15], E. Pirovano[27], J. Plaza[2], S. Pomp[46], I. Porras[31], J. Praena[31], J. M. Quesada[22], R. Reifarth[25], D. Rochman[28], Y. Romanets[26], C. Rubbia[2], A. Sánchez[9], M. Sabat´e-Gilarte[2], P. Schillebeeckx[33], D. Schumann[28], A. Sekhar[15], A. G. Smith[15], N. V. Sosnin[39], A. Sturniolo[6], G. Tagliente[4], D. Tarr´io[46], P. Torres-Sánchez[31], S. Urlass[36], E. Vagena[1], S. Valenta[38], V. Variale[4], P. Vaz[26], G. Vecchio[11], D. Vescovi[25], V. Vlachoudis[2], T. Wallner[36], P. J. Woods[39], T. Wright[13], R. Zarrella[40], and P. Žugec,[16] The n_TOF Collaboration