

# “CMPWG-II” Computational Medical Physics Working Group Workshop II

Sep 30 – Oct 3, 2007  
University of Florida (UF) Hilton  
Hotel and Conference Center  
Gainesville, Florida USA



## RSICC

**Nuclear and Radiological Engineering**  
at the University of Florida

*Sponsored by the University of Florida, in cooperation with the Computational Medical Physics Working Group of the ANS (MCD and BMD Divisions), the UF Department of Nuclear and Radiological Engineering (NRE), UF College of Medicine Departments of Radiation Oncology and Radiology, Radiation Safety Information Computational Center (RSICC) and Organization for Economic Cooperation and Development/Nuclear Energy Agency Data Bank (OECD/NEADB)*

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Graduate Asst Liaisons: Monica Ghita ([ghita1mc@ufl.edu](mailto:ghita1mc@ufl.edu)), Ahmad Al-Basheer ([akas30@ufl.edu](mailto:akas30@ufl.edu))

**CMPWG-II Program Co-Chairs:** Glenn Sjoden, Ali Haghghat, and Bernie Kirk

**CMPWG-II Technical Program Co-Chairs:** Wes Bolch, David Hintenlang, and Sanjiv Samant

To Register, go to <http://conferences.dce.ufl.edu/basic/229.aspx>

**PURPOSE:** The purpose of this meeting is to provide a technical exchange of ideas and a forum for novel approaches to simulating radiation transport and dosimetry for accurate and efficient assessments of dose, treatment planning, image quality evaluations, calibration, verification, and validation, etc.

**CMPWG-II Technical Program Committee:** Hatice Akkurt (ORNL), Arzu Alpan (Westinghouse), Manuel Arreola (UF Radiology), Yousry Azmy (Penn State), Wesley Bolch (NRE), Sang Cho (Georgia Tech), James Dempsey (UF Radiation Oncology), David Gilland (NRE), Tim Goorley (LANL), Alireza Haghghat (NRE), David Hintenlang (NRE), Bernadette Kirk (ORNL), Dave Nigg (INEL), Jatinder Palta (Radiation Oncology), Farzad Rahnema (Georgia Tech), Sanjiv Samant (NRE), Glenn Sjoden (NRE), Ken Van Riper (White Rock Science), Pedro Vaz (ITN), Mark Williams (ORNL), George Xu (RPI)

**This is the Second Computational Medical Physics Working Group Workshop (“CMPWG-II”).** The first workshop was held at Oak Ridge National Laboratory, in 2005. Guest speakers from Radiation Oncology and Radiology will discuss the unique challenges ahead for medical physics simulations, verification, and validation in therapy and diagnostic applications.

**Workshop Agenda:**

30 Sep 07	Arrival and Check in at Hilton (Full Papers Due)
1 Oct 07	Code Workshops*: Deterministic PENTRAN; Monte Carlo: GEANT4 Automated Variance Reduction: ADEIS, A <sup>3</sup> MCNP
2 Oct 07	Plenary Session (morning), Technical Presentations
2 Oct 07	(Evening) Workshop Banquet, Student Paper Awards
3 Oct 07	Technical Presentations (cont'd); Code Workshop: MCNP5/X; Workshop conclusion

**ABSTRACTS EXTENDED DUE DATE:** An abstract template can be found at <http://cmpwg.ans.org>. Abstracts are required and will be a minimum of 500 words, to a maximum of 1000 words. **Abstracts will be due by 25 August 2007** and may be submitted to [sjoden@ufl.edu](mailto:sjoden@ufl.edu).

**PAPERS:** Full papers (8-10 pages, using the abstract template format) based on approved abstracts are due upon arrival to the Workshop, and will be published as Technical Proceedings. **Instructions for accepted papers on the basis of the abstract will be provided at the time of acceptance, on or before 25 August 2007.** “Best” quality full papers presented upon registration will be selected and forwarded for further peer review and publication in a special edition of the *Nuclear Technology Journal*, a publication of the American Nuclear Society; a venue for publication in Medical Physics will be made available. MS-Word or PDF format is required. A template can be found at <http://cmpwg.ans.org>.

**CODE WORKSHOPS:** Code workshops will be presented in serial sessions to permit maximum exposure to computational methods and technologies applied to computational medical physics problems. Detailed modeling and simulation discussions will be presented on one to two hour sessions. Should other code sponsors wish to host a workshop on their code, please contact [sjoden@ufl.edu](mailto:sjoden@ufl.edu) to schedule it.

**SESSION ORGANIZATION:** Every attempt will be made to restrict the agenda to serial sessions to afford maximum participation. Parallel sessions are not planned at this time.

**IF YOU PLAN TO ATTEND / PLAN TO PRESENT,  
PLEASE SEND A BRIEF EMAIL TO [sjoden@ufl.edu](mailto:sjoden@ufl.edu) SO THAT WE CAN PROPERLY  
ANTICIPATE THE NUMBER OF PARTICIPANTS.**

**STUDENT AWARDS:** Graduate Student Awards will be selected by members of the Technical Program Committee for a Cash Award (sponsored through the UF Foundation) based on presentation technical quality and Content. ANS support is pending.

**TRANSPORTATION:** Flights are available directly to the Regional Airport in Gainesville, Florida (15 minutes by auto from the Hotel and Conference Center and UF campus). Alternative air terminals can be used from Jacksonville, Florida (2 hours by auto), Orlando, Florida (2+ hours by auto), Tallahassee, Florida (2+ hours by auto), Tampa, Florida (2+ hours by auto). Transportation to the hotel can be scheduled for the shuttle to the hotel. A rental car is recommended for those who wish to have mobility throughout the Gainesville area.

**LODGING:** Lodging reservations may be made directly with the Hilton Hotel and Conference Center (352-371-3600) by specifying Rate Code "CMPWG-II" (\$129/night). Questions on facilities related to the workshop can be directed to the NRE Department, 352-392-1401. For rate questions, contact Diana Dampier, x303. For Program questions, contact Glenn Sjoden, x323. Wireless Internet will be available at the conference hotel.

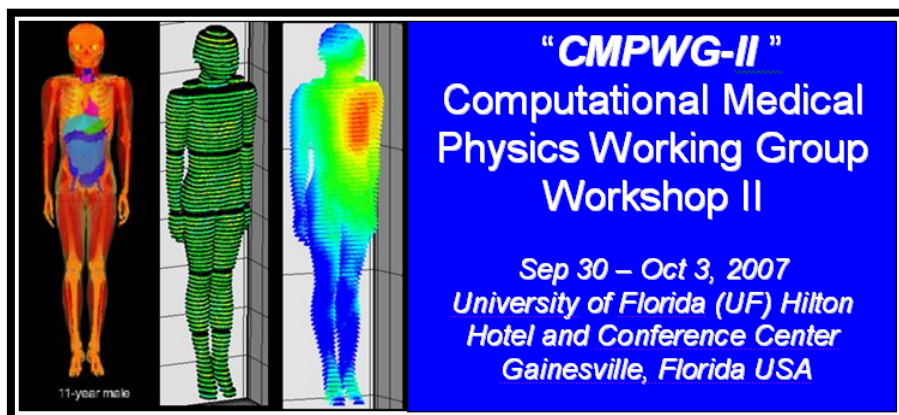
**REGISTRATION:** Conference Registration is \$300/person, \$100/student participants. Please go to <http://conferences.dce.ufl.edu/basic/229.aspx> to register before 1 Sep 07. Credit Cards are accepted.

*Invitees presenting code workshops should not register, but should send an email to Glenn Sjoden at [sjoden@ufl.edu](mailto:sjoden@ufl.edu) to confirm their attendance and presentation of a code workshop. Code Workshop presenters are responsible for supplying major printed matter/materials to be distributed at the workshop.*

**GROUP WEB SITE:** <http://cmpwg.ans.org>

**For more information, contact:**

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## “CMPWG-II” Preliminary Program

**Sun 30 Sep 07**    **Arrival and Check in at Hilton (Full Papers Due)**

**Mon 1 Oct 07**    **Code Workshops-I:**

0830-0845    Welcome, Introduction to Code Workshops  
 0845-1015    PENTRAN-MP (G. Sjoden, A. Al-Basheer, M. Ghita, UF, Invited)  
 1015-1045    Break  
 1045-1215    GEANT4 (M. Pia, CERN, Invited)  
 1215-1345    Lunch  
 1345-1515    PENELOPE (F. Salvat, UB/ECM, Invited)  
 1515-1530    Break  
 1530-1730    ADEIS & A<sup>3</sup>MCNP (B. Dionne & A. Haghightat, UF, Invited)  
 1730-1800    Conclusion, Open Discussion Period

**Tue 2 Oct 07**    **Plenary Session (morning)**

0900-0935    “On Critical Needs for Computation in Radiation Therapy”  
                   --Dr Jatinder Palta (UF Radiation Oncology, Invited)  
 0945-1020    “On the Importance of Computation in Clinical Radiology”  
                   --Dr Manuel Arreola (UF Radiology, Invited)  
 1030-1100    “New Concepts in Dose delivery accounting for Organ Motion”  
                   --Dr James Dempsey (UF Radiation Oncology, and CSO of  
                   View Ray, Invited)  
 1100-1230    Lunch

**Tue 2 Oct 07**    **Technical Presentations, including Student Papers (afternoon)**

1300-1320    “A Skeletal Reference Dosimetry Model for the Adult Female  
                   -- (Kayla Kielar<sup>1</sup>, Amish Shah<sup>2</sup>, Wesley Bolch<sup>1</sup>, UF, MD  
                   Anderson Cancer Center)  
 1320-1340    “Development of Hybrid Computational Newborn Phantom For  
 Dosimetry Calculation: the Skeleton”  
                   -- (Deanna Hasenauer<sup>1</sup>, Choonsik Lee<sup>1</sup>, Daniel L. Lodwick<sup>1</sup>,  
                   Christopher J. Watchman<sup>2</sup>, Wesley E. Bolch<sup>1</sup>, UF, UA)

- 1340-1400 “An Anthropometric Approach to Assigning Reference Phantoms to Individual Patients for Medical Organ Dose Reconstruction”  
-- (Scott Whalen, Wesley E. Bolch, UF, UA)
- 1400-1420 “Deterministic 3D Radiation Transport Simulation for Dose Distribution and Organ Dose Evaluation in Diagnostic CT”  
-- (Monica Ghita, Glenn Sjoden, Manuel Arreola, Ahmad Al-Basheer, Choonsik Lee, Wesley Bolch, UF)
- 1420-1440 “Electron Dose Kernels to Account for Secondary Particle Transport in Deterministic Simulations”  
-- (Ahmad Al-Basheer, Glenn Sjoden, Monica Ghita, UF)

**1440-1540 Coffee Break**

- 1540-1600 “Development of a fast and robust 2D-3D Registration Method for Image-Guided Radiation Therapy”  
-- (Jian Wu, Minh Kim, Jayinder Palta, Sanjiv Samat, UF)
- 1600-1620 “Statistical Approach to Medical Image Errors Analysis”  
-- (S. M. Aceil, Alcorn State University)
- 1620-1640 “Comparative Analysis of Nuclear Cross Sections in Monte Carlo Methods for Medical Physics Applications”  
-- (Chris Myers<sup>1</sup>, Bernadette L. Kirk<sup>2</sup>, Luiz C. Leal<sup>2</sup>, GT, ORNL)

**Workshop Banquet, Student Paper Awards**

1830-2130 Hilton Hotel

**Wed 3 Oct 07 Technical Presentations**

- 0900-0925 “Effect of abdominal subcutaneous fat on organ dose in radiography and computed tomography: Monte Carlo calculation study”  
-- (Choonsik Lee, Daniel Lodwick, Deanna Hasenauer, Wesley Bolch, UF)
- 0925-0950 “HDRK-Man: A Whole Body Voxel Model Based on High-Resolution Color Slice Image of a Korean Adult Male Cadaver”  
-- (Chan Hyeong Kim<sup>1</sup>, Sang Hyun Choi<sup>1</sup>, Jong Hwi Jeong<sup>1</sup>, Choon-Sik Lee<sup>2</sup>, Min Suk Chung<sup>3</sup>, HU, UF, AU)
- 0950-1015 “An Electron/Photon Transport Bibliographic Database”  
-- (John C. Garth)
- 1015-1040 “Multidimensional Coupled Photon-Electron Transport Simulations Using Neutral Particle Sn Code”  
-- (Dan Ilas, Mark L. Williams, Douglas E. Peplow, Bernadette L. Kirk, ORNL)
- 1040-1105 “Implementation of Salivary Glands in the Body Builder Anthropomorphic Phantoms”  
-- (Kenneth A. Van Riper<sup>1</sup>, James Roberts<sup>2</sup>, Josephine Clorley<sup>2</sup>, White Rock Science, Velindre Cancer Centre)
- 1105-1130 “An Image Based Skeletal Canine Model For Pre-Clinical Evaluation of Osteosarcoma Molecular Radiotherapy”  
-- (Wesley Bolch, Laura Padilla, Choonsik Lee, Rowan Milner, Amir Shahlaee, UF)

1130-1300 Lunch

**Code Workshops-II:**

1300-1500 MCNP5/X (T. Goorley, LANL, Invited)

1500-1530 SCAN2MCNP Code (K. Van Riper, Invited)

**Wed 3 Oct 07 Technical Presentations (Cont'd)**

1530-1555 "MCNP4C3-Based Simulation of a Medical Linear Accelerator"  
-- (Siva R. Manoharan, L. Venkatanarayana, M. Chandrasekar, Redding Cancer Treatment Center)

1555-1620 "Coupled Photon/Electron Coarse Mesh Transport Method for Dose Analysis Tissue"  
-- (Dingkang Zhang and Farzad Rahnema, GT)

1620-1645 "Comparison of Predictions by MCNP and EGSnrc of Radiation Dose imparted to various Material Targets by Beams and small volumetric Sources."  
-- (Eric Steinfelds)

1645-1745 Open Technical Discussions and Conclusion  
Next Meeting, Fall 2009: Georgia Tech

