



Professor Dr. rer. nat. Dr. med. habil. Fridtjof Nüsslin

Born: 30.07.1939 in Berlin

Career, Employments:

- 1959-1968 Studies of Physics & Physiology, University of Tübingen, Max-Planck-Institute Nuclear Physics Heidelberg, University of Heidelberg
- 1968-1970 Postdoc Max-Planck-Institute Nuclear Physics Heidelberg,
- 1970 -1982 Assistent Medical Physics – Radiotherapy Dept., Medizinische Hochschule Hannover
- 1982 – 1987 Senior Medical Physicist, Clinic Radiooncology, Nord-West-Krankenhaus Frankfurt/Main
- 1987 – 2004 Full Professor and Chair Section Medical Physics, Radiotherapy Dept., University Hospital, Universität Tübingen
- 2004 Professor Biomedical Physics, Klinik für Strahlentherapie, Klinikum rechts der Isar der Technischen Universität München
- 2007 Member of the Munich Advanced Photonics (MAP) research cluster
- 2011 Member of the Executive Board of MAP

Professional Positions (selection):

- 1990-1994 President Deutsche Gesellschaft für Medizinische Physik (DGMP)
- 1994-1996 Chair Scientific Committee of European Federation of Organizations for Medical Physics (EFOMP)
- 1996-1998 President EFOMP
- since 2000 Member of the Advisory Board Medical Technology of the German Research Foundation (DFG)
- 2009-2012 Editor in Chief of the European Journal for Medical Physics (EJMP)
- since 2009 Liaison of the IOMP at the International Council for Science (ICSU)
- 2009-2012 President International Organization for Medical Physics (IOMP)
- since 2010 President International Commission for Medical Physics (ICoMMP/AC4) of the International Union for Pure and Applied Physics (IUPAP)
- 2012 Member of the Congress Coordinating Committee of the World Congress for Medical Physics and Biomedical Engineering (WC2012) in Beijing

since 2010 Liaison IOMP at the IAEA “Programme of Action for Cancer Treatment” (PACT)
2012-2015 Immediate Past President IOMP
2012-2015 Vice President International Union of Physical and Engineering Sciences in Medicine (IUPESM)

Scientific Activities

Dosimetry and Treatment Planning Optimization, Conformal Radiotherapy, Image Guidance, Advanced Technologies (particle beam therapy, laser application in imaging & particle beam therapy, Biological & Molecular Imaging, Modeling in Tumorbiology).

Honours

2004 Honorary membership of the Czech Association for Medical Physicists (CAMP)
2005 Honorary membership of the European Federation of Organisations for Medical Physics (EFOMP)
2006 Honorary membership DEGRO (German Society of Radiooncology)
2008 Honorary membership OEGRO (Austrian Society of Radiooncology)
2008 Distinguished Affiliated Professor, Technische Universität München (TUM)
2009 Fellow Institute of Advanced Studies, Technische Universität München (TUM-IAS)
2011 Richard-Glocker-Award DGMP (German Society for Medical Physics)
2011 Honorary membership SMPS (Saudi Medical Physics Society)
2013 Fellow International Organization for Medical Physics (IOMP)

Selection of Publications since 2002

Nüsslin, F.: Medizinische Physik und Bildgebung - Perspektiven für Forschung und Routine. Fortschr. Röntgenstr. 174 (2002), 19 - 22
Bakai, A., F. Paulsen, L. Plasswilm, M. Bamberg, F. Nüsslin: Untersuchungen zur Positionierungsgenauigkeit bei Prostatakonformationsbestrahlungen mittels Portal-Imaging. Strahlentherapie und Onkologie 178 (2002), 84 – 90
Alber, M., F. Nüsslin: Ein Konzept zur Optimierung von klinischer IMRT. Zeitschrift für Medizinische Physik 12 (2002), 109 - 113
Alber, M., M. Birkner, F. Nüsslin: Tools for the analysis of dose optimisation (I): effect-volume-histograms. Physics in Medicine and Biology 47 (2002), 2451 - 2458
Alber, M., M. Birkner, F. Nüsslin: Tools for the analysis of dose optimisation II: sensitivity analysis. Physics in Medicine and Biology 47 (2002), N265 - N270
Alber, M., G. Meedt, R. Reemtsen, F. Nüsslin: On the degeneracy of the IMRT optimisation problem. Medical Physics 29 (2002), 2584 - 2589
F. Haryanto, M. Fippel, W. Laub, O. Dohm, F. Nüsslin: Investigation of photon beam output factors for conformal radiation therapy - MC simulations and measurements. Physics in Medicine and Biology 47 (2002) N133 - N143
Kaulich, T.W., U. Lamprecht, F. Paulsen, F. Kahmann, U. Maurer, T.O. Henkel, W. Loeser, K. H. Bichler, F. Nüsslin, M. Bamberg: Physikalische Grundlagen und klinische Durchführung der interstitiellen Brachytherapie der Prostata mit Jod-125. Strahlentherapie und Onkologie 178 (2002), 548 - 555
Kaulich, T.W., U. Lamprecht, F. Paulsen, J. Lorenz, U. Maurer, W. Loeser, K.H. Bichler, F. Nüsslin, M. Bamberg: Physikalisch-technische Qualitätssicherung und Strahlenschutz bei der Monotherapie der Prostata mit Jod-125- Seeds. Strahlentherapie und Onkologie 178 (2002), 667 – 675
Buck, D., M. Alber, F. Nüsslin: Potential and limitations of the automatic detection of fiducial markers using an amorphous silicon flat-panel imager. Physics in Medicine and Biology 48 (2003), 763 - 774
Bakai, A., M. Alber, F. Nüsslin: Estimation of a radiation time prolongation factor for intensity-modulated radiotherapy, Physics in Medicine and Biology 48 (2003) N25-N29
Bär, W., M. Alber, F. Nüsslin: Fluenzmodulierte Strahlentherapie mit in die Optimierung integrierter Segmentierung. Zeitschrift für Medizinische Physik 13 (2003) 12-15
Meedt, G., M. Alber, F. Nüsslin: Non-coplanar beam direction optimization for intensity-modulated radiotherapy, Physics in Medicine and Biology 48 (2003) 2999-3019
Birkner, M., D. Yan, M. Alber, J. Liang, F. Nüsslin: Adapting inverse planning to patient and organ geometrical variation: algorithm and implementation. Medical Physics 30 (2003), 2822
Bakai, A., M. Alber, F. Nüsslin: A revision of the γ -evaluation concept for the comparison of dose distributions. Physics in Medicine and Biology 48 (2003) 3543-3553
Fippel, M., F. Haryanto, O. Dohm, F. Nüsslin, S. Kriesen: A virtual photon energy fluence model for Monte Carlo dose calculation Medical Physics 30 (2003) 301-311
Fippel, M., F. Nüsslin, Smoothing Monte Carlo circulated dose distributions by iterative reduction of noise Physics in Medicine and Biology 48 (2003) 1289-1304

- Bär, W., M. Schwarz, M. Alber, L. Bos, B. Mijnheer, C. Rasch, Ch. Schneider, F. Nüsslin, E. Damen: A comparison of forward and inverse treatment planning for intensity-modulated radiotherapy of head and neck cancer. 2, *Radiotherapy & Oncology* 69 (2003) 251-258
- Haryanto, F., M. Fippel, A. Bakai und F. Nüsslin: Study on the Tongue and Groove Effect of the Elekta Multileaf Collimator Using Monte Carlo Simulation and Film Dosimetry. *Strahlentherapie und Onkologie* 180 (2004) 57-61
- Baum, C., Alber, M., Birkner, M., Nüsslin, F.: Treatment simulation approaches for the estimation of the distributions of treatment quality parameters generated by geometrical uncertainties. *Phys Med Biol* 49 (2004) 5475-5488
- Kaulich, T.W., Zurheide, J., Haug, T., Budach, W., Nüsslin, F., Bamberg, M.: On the actual state of industrial quality assurance procedures with regard to (106)Ru ophthalmic plaques. *Strahlenther. Onkol.* 180 (2004) 358-364
- Kaulich, T.W., Zurheide, J., Haug, T., Nüsslin, F., Bamberg, M.: Clinical quality assurance for 106Ru ophthalmic applicators. *Radiat. Oncol.* 76 (2005), 86-92
- C. Baum, M. Birkner, M. Alber, F. Paulsen, F. Nüsslin: Dosimetric consequences of the application of off-line setup error correction protocols and a hull-volume definition strategy for intensity modulated radiotherapy of prostate cancer. *Radiat. Oncol.* 76 (2005), 35-42
- Dohm OS, Fippel M, Christ G, Nüsslin F. Off-axis chamber response in the depth of photon dose maximum *Phys Med Biol.* 2005 Apr 7;50(7):1449-57
- AL Grosu, Molls M, Zimmermann FB, Geinitz H, Nüsslin F, Schwaiger M, Nieder C.: High-precision radiation therapy with integrated biological imaging and tumor monitoring: evolution of the Munich concept and future research options. *Strahlentherapie und Onkologie* 182 (2006)361-368.
- Nüsslin F.: Current status of medical technology. *Acta Neurochir Suppl.* 2006;98:25-31.
- Kuhn KA, Knoll A, Mewes HW, Schwaiger M, Bode A, Broy M, Daniel H, Feussner H, Grading R, Hauner H, Höfler H, Holzmann B, Horsch A, Kemper A, Krcmar H, Kochs EF, Lange R, Leidl R, Mansmann U, Mayr EW, Meitinger T, Molls M, Navab N, Nüsslin F, Peschel C, Reiser M, Ring J, Rummeny EJ, Schlichter J, Schmid R, Wichmann HE, Ziegler S.: Informatics and medicine--from molecules to populations. *Methods Inf Med.* 2008;47(4):283-95.
- B. Röper, G. Dollinger, V. Hable, C. Greubel, A. A. Friedl, P. Kneschaurek, F. Nüsslin, M. Molls, T. E. Schmid, „Laser-generated particle beams on their way to radiation oncology: report from the excellence cluster MAP (Munich-Centre for Advanced Photonics)”, *Radiother. Oncol.* 90 Suppl 3: 51 (2009)
- Shi K, Souvatoglou M, Astner S, Vaupel P, Nüsslin F, Wilkens JJ, Ziegler SI: Quantitative Assessment of Hypoxia Kinetic Models by a Cross-study of Dynamic 18F-FAZA and 15O-H2O PET in Patients with Head and Neck Tumors. *J Nucl Med* 51;1386-94 (2010)
- Shi K., Astner ST, Sun L, Navab N, Nüsslin F, Vaupel P, Wilkens JJ Sparse dose planning based on a dual-pass kinetic-oxygen mapping of dynamic PET images, *Med Image Comput Assist Interv*: 14, 484-91 (2011)
- Nüsslin F, Smith P: Medical Physics now classified internationally as a profession. *Med. Phys.* 38, (2011)
- Smith PS, Nüsslin F : Benefits to medical physics from the recent inclusion of medical physicists in the International Classification of Standard Occupations (ICSO-08), *Medical Physics International* 2013
- Rosenwald JC, Nüsslin F: Marie Curie's contribution to Medical Physics, *Eur J Med Phys* 29, 423-425 (2013)
- P.R. Bolton, M. Borghesi, C. Brenner, D.C. Carroll, C. De Martinis, A. Flacco, V. Floquet, J. Fuchs, P. Gallegos, D. Giove, J. S. Green, S. Green, B. Jones, D. Kirby, P. McKenna, D. Neely, F. Nuesslin, R. Prasad, S. Reinhardt, M. Roth, U. Schramm, GG.. Scott, A, Ter-Avetisyan, M. Tolley, G. Turchetti, and J.J. Wilkens: Instrumentation for Diagnostics and Control of Laser-accelerated Proton (Ion) Beams, *Eur J Med Phys*, accepted for publication.
- Jan C. Peekena, Michael Bernhoferb, Benedikt Wiestlerc, Tatyana Goldbergd, Daniel Cremersb, Burkhard Rostb, Jan J. Wilkensa, Stephanie E. Combs, Fridtjof Nüsslin: Radiomics in radiooncology – Challenging the medical physicist, *Physica Medica* 48 (2018) 27–36
- Peeken JC, Bernhofer M, Wiestler B, Goldberg T, Cremers D, Rost B, Wilkens JJ, Combs SE, Nüsslin F (2018) Radiomics in radiooncology - Challenging the medical physicist. *Phys Med* 48:27-36. doi:10.1016/j.ejmp.2018.03.012
- Peeken JC, Goldberg T, Knie C, Komboz B, Bernhofer M, Pasa F, Kessel KA, Tafti PD, Rost B, Nüsslin F, Braun AE, Combs SE (2018) Treatment-related features improve machine learning prediction of prognosis in soft tissue sarcoma patients. *Strahlentherapie und Onkologie : Organ der Deutschen Röntgengesellschaft [et al]* 194 (9):824-834. doi:10.1007/s00066-018-1294-2
- Peeken JC, Goldberg T, Pyka T, Bernhofer M, Wiestler B, Kessel KA, Tafti PD, Nüsslin F, Braun AE, Zimmer C, Rost B, Combs SE (2019) Combining multimodal imaging and treatment features improves machine learning-based prognostic assessment in patients with glioblastoma multiforme. *Cancer medicine* 8 (1):128-136. doi:10.1002/cam4.1908
- Peeken JC, Hesse J, Haller B, Kessel KA, Nüsslin F, Combs SE (2018) Semantic imaging features predict disease progression and survival in glioblastoma multiforme patients. *Strahlentherapie und Onkologie : Organ der Deutschen Röntgengesellschaft [et al]* 194 (6):580-590. doi:10.1007/s00066-018-1276-4