

June 7, 2024

INAUGURAL LECTURES

Clinical Physics: from ideas to implementation

TU/e

EINDHOVEN
UNIVERSITY OF
TECHNOLOGY

From left to right:

Prof.dr.ir. Carola van Pul was appointed as part-time Professor of Physics for Diagnosing and Monitoring on December 1, 2022.

Prof.dr.ing. Coen Hurkmans was appointed as part-time Professor of Radiation Therapy Clinical Physics on January 1, 2023.

The Department of Electrical Engineering and the Department of Applied Physics and Science Education at Eindhoven University of Technology (TU/e)

Carola and Coen will jointly deliver their inaugural lectures on Friday, June 7, 2024, at 15.30. The inaugural lectures will be preceded by a TU/e MedTech Day symposium titled 'Clinical Physics; from ideas to clinical implementation', dedicated to the themes of the lectures, from 9.30 to 14.30.

ABOUT THE LECTURES

Innovation in healthcare is vital for advancing medical treatments, enhancing patient outcomes and optimizing healthcare delivery. However, the trajectory from an innovation to clinical application is long due to regulatory complexities, development costs, interoperability in current practice and educational needs regarding the adoption of new technologies. In this lecture, we will zoom in on bridging the gap in the field of clinical physics.

First, in his lecture 'Klinische Fysica Radiotherapie: Leren, Innoveren, Implementeren en Valideren', Coen will sketch the position that radiotherapy holds in the treatment of cancer patients and how radiotherapy developed from the end of the 19th century to now. Improved medical technology has enabled us to go from very long treatment schedules of five to seven weeks of daily treatments to only one or a few treatments for many patients currently. This has not only lowered the burden on patients but also on clinical staff, which is important considering the expected shortage of staff and the foreseen increase in cancer patients. Using some practical examples, Coen will explain why a combination of learning, innovating, implementing and validating is essential to developing and safely and effectively using medical technology within radiotherapy. He will also explain which current and future challenges we face in keeping radiotherapy at a high level and available to everyone.

Next, in her lecture 'Physics of Diagnosing and Monitoring', Carola will focus on general medical physics and developments in sensors and monitoring systems. Examples from the highly technological environment of neonatal intensive care units will be presented, where technological developments are needed to support care for fragile infants. This requires less obtrusive diagnostics, early warning systems and interoperability with existing medical equipment. Medical technology can only be advanced through a multidisciplinary approach that aligns engineering aspects with clinical and patient needs. Integrating these innovations seamlessly into existing hospital systems is essential for their adoption.

INVITATION

The Executive Board of Eindhoven University of Technology cordially invites you to attend the inaugural lectures of Prof.dr.ing. Coen Hurkmans and Prof.dr.ir. Carola van Pul on **Friday, June 7, 2024, at 15.30**.

The inaugural lectures will be preceded by a symposium, 'MedTech Day 2024', dedicated to the themes of the lectures, **from 9.30-14.30**. Information about the symposium and registration can be found **here**.

The public lectures will be delivered in the Blauwe Zaal of the Auditorium. In case you cannot attend, the inaugural lectures will also be streamed via **<https://vimeo.com/event/4126826>**.

The titles of the lectures are:

Coen Hurkmans: 'Klinische Fysica Radiotherapie: Leren, Innoveren, Implementeren en Valideren'

Carola van Pul: 'Physics of Diagnosing and Monitoring'

After the lecture, drinks will be served in the Senaatszaal.

All professors are invited to join the cortège. If you would like to participate, please register in advance with the Office of Doctoral Presentations and Academic Ceremonies, phone +31 (0) 40 247 37 42, email **penp@tue.nl**.



Prof.dr. Silvia Lenaerts
Rector Magnificus

After June 7, 2024, the text of the inaugural lectures will be available online at **research.tue.nl/en/**.

Prof.dr.ir. Carola van Pul studied Applied Physics in Delft and obtained her PhD in diffusion tensor MRI for imaging infants at TU/e in 2004 while simultaneously working as a trainee in medical physics. In 2006, she obtained her registration and, since then, she has worked as a medical physicist at Maxima Medical Centre. In 2015, she returned to TU/e one day per week as an associate professor in Applied Physics at the School of Medical Physics and Engineering, with teaching and research tasks. In December 2022, she was appointed as part-time Professor of Physics for Diagnosing and Monitoring in the Biomedical Diagnostics Lab at TU/e, with a special focus on patient monitoring and alarms for neonatal intensive care. In the last decade, her work has focused on the development and implementation of new sensor and monitoring techniques for clinical practice and on artificial intelligence approaches to predict deterioration in neonatal monitoring applications. Carola works within the eMTIC consortium, focusing on a multidisciplinary approach to improve the implementation of new innovations in healthcare.

Prof.dr.ing. Coen Hurkmans obtained his MSc in Experimental Physics from Utrecht University in 1995 and his PhD from the University of Amsterdam in 2001. For his education, he also spent time at the university hospital in Lund (Sweden) and the Netherlands Cancer Institute. From 2002 to 2011, Hurkmans worked at Catharina Hospital in Eindhoven as a clinical physicist. Next, he became their Head Clinical Physicist for Radiotherapy, a position he still holds. In 2023, he joined Eindhoven University of Technology as a part-time Professor in Radiation Therapy Clinical Physics. Hurkmans' main focus will be on the implementation and validation of advanced radiation therapies. An important research topic will be the improvement and efficient use of MR imaging for treatment planning and real-time tracking during radiation therapy. Artificial intelligence has the potential to speed up image reconstruction, opening the way to real-time, online adaptive replanning and radiation. Coen Hurkmans intends to build the bridge between the fundamental electrical engineering, imaging, and artificial intelligence expertise at TU/e.

Visiting address Auditorium, Building 1, Groene Loper, Eindhoven

Navigation address De Zaale, Eindhoven, www.tue.nl/map