

6th ECMP 2026

European Congress of Medical Physics

23-26 September 2026 | Valencia | Spain



Image Reconstruction for Quantitative Molecular Diagnostics & Radionuclide Therapy

September 23, 2026 | Valencia, Spain

Course Description

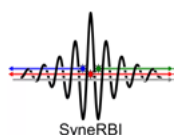
This course provides a focused overview of image reconstruction methods that enable accurate quantification in molecular imaging, with particular emphasis on applications in radionuclide therapy. Quantitative Positron Emission Tomography (PET) and Single Photon Emission Computed Tomography (SPECT) play a central role in patient-specific dosimetry, therapy planning, and response assessment. However, achieving reliable quantitative accuracy requires careful consideration of image reconstruction algorithms and correction techniques. The course will introduce the clinical and research role of quantitative PET and SPECT in radionuclide therapy. It will then cover the physical and computational principles underlying mainstream image reconstruction algorithms, including attenuation, scatter, resolution modelling and motion compensation. Emphasis will be placed on how these corrections influence quantitative accuracy, precision and reproducibility.

Participants will also be introduced to the open-source STIR (<http://stir.sf.net>) and SIRF (<https://www.ccpsynerbi.ac.uk/softwareframework-html/>) libraries, which provide flexible tools for developing and evaluating reconstruction workflows. A dedicated practical session will demonstrate how these frameworks can be used to implement and test reconstruction strategies.

The course is designed for medical physicists seeking to deepen their understanding of reconstruction methods in PET and SPECT and their impact on quantitative molecular diagnostics and radionuclide therapy.

Learning Objectives

- Understand the importance of accuracy and precision in quantitative PET and SPECT for radionuclide therapy and molecular diagnostics.
- Explain key principles and parameters of the reconstruction algorithms used in PET and SPECT imaging.
- Identify and evaluate major correction factors affecting quantitative accuracy and precision (data statistics, attenuation, scatter, resolution modelling and motion).
- Assess the impact of reconstruction choices on dosimetry and therapy response evaluation.



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- Gain practical familiarity with the STIR and SIRF software frameworks.
- Apply reconstruction tools to example datasets for quantitative PET and SPECT analysis.





Faculty

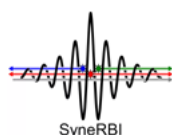
- » **Charalampos Tsoumpas** | University Medical Center Groningen, NL
- » **John Dickson** | University College London, UK
- » **Ludovica Brusaferrì** | London South Bank University, UK
- » **Stathis Varzakis** | University College London, UK

Timetable

	TITLE	LECTURERS
9.00–9.15	COURSE PRESENTATION	Charalampos Tsoumpas
9.15–10.15	ROLE OF QUANTITATIVE PET AND SPECT IN RADIONUCLIDE THERAPY	John Dickson & Charalampos Tsoumpas
10.15–11.15	PET RECONSTRUCTION & CORRECTIONS FOR ACCURATE & PRECISE QUANTIFICATION	Ludovica Brusaferrì & Charalampos Tsoumpas
11.15–11.45	COFFEE BREAK – AVAILABLE AT PARTICIPANTS EXPENSE IN THE CONGRESS VENUE	
11.45–12.45	SPECT RECONSTRUCTION & CORRECTIONS FOR ACCURATE & PRECISE QUANTIFICATION	John Dickson & Stathis Varzakis
12.45–13.45	LUNCH BREAK – AVAILABLE AT PARTICIPANTS EXPENSE IN THE CONGRESS VENUE	
13.45–14.45	LIVE DEMONSTRATION OF STIR LIBRARY	Ludovica Brusaferrì & Charalampos Tsoumpas
14.45–15.45	LIVE DEMONSTRATION OF SIRF LIBRARY	Stathis Varzakis & Charalampos Tsoumpas
15.45–16.00	SUMMARY & OPEN DISCUSSION	All

Further information

	Course language	English
	Level	MPE - Level 8
	Maximum no. of participants	40
	Duration	23 rd September 2026
	Study load	6 hours of lectures, demos & discussions
	CPD Points	Points to be confirmed (EBAMP Accreditation and Spanish certification (EVES))



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