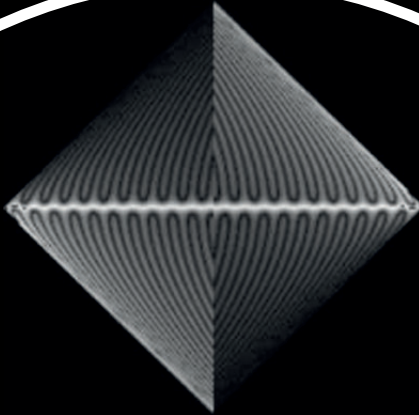


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European Society for Magnetic Resonance in Medicine and Biology



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# Lectures on MR 2014

Educational courses, exercises, and practical demonstrations  
on MR Physics and Engineering

**Create your own echo:  
How to generate, calculate  
and manipulate echoes**  
September 17–19, 2014  
Munich/DE

**Programme director:**

Klaus Scheffler

**Course & local organisers:**

Carl Ganter

Klaus Scheffler

# Create your own echo: How to generate, calculate and manipulate echoes

## Course venue:

Klinikum rechts der Isar  
Technical University of Munich  
Germany

## Course language:

English

## Course description:

The design and understanding of rapid imaging sequences seems to be a carefully sealed and treasured secret. A train of RF pulses and gradient pulses produce an unmanageable amount of echoes, and these echoes have to be combined and selected very meticulously to produce a useful signal for rapid imaging. How big should we choose the spoiler gradient within a gradient echo sequence, and what do we spoil? Can we use a HyperEcho to reverse a gradient echo sequence? What is the steady state and its resulting contrast?

## Educational level:

This course is suited for established MR physicists, engineers, and other scientists with several years of direct experience in performing MRI applications and/or MRI technological research and development. The advanced course intends to provide a deeper understanding and mathematical description of state-of-the-art, rapid imaging principles.

## Topics:

- Description of magnetisation in spatial and Fourier domain
- Signal formation in rapid gradient echo sequences
- Signal formation in rapid spin echo sequences
- Special rapid imaging techniques

## Preliminary faculty:

O. Bieri, C. Ganter, K. Scheffler, M. Weigel

The Lectures on Magnetic Resonance programme will be applied for accreditation by the European Federation of Organisations for Medical Physics (EFOMP).

A certificate of attendance will be available online for participation in the entire course.