SEMINAR

APPLIED MATHEMATICS AND MECHANICS

FS1016 7 October 2025

A DCAMM seminar No. 792 will be presented by

Dr. Julius Hohlfeld
Senior Research Scientist at the Institute Jean Lamour, University of Lorraine,
Nancy, France

The title of the lecture is

Modern Hard Disk Drives: Applied Science in a Box

Abstract:

In the first part of my talk, I will introduce some of the diverse challenges that need to be solved in order to make hard disk drives work. In contrast to common believe, most of these challenges are not about magnetics, but cover a wide range of topics such as aerodynamics, thermodynamics, chemistry/molecular dynamics, tribology, high-speed electronics, pattern recognition, thin film processing and material science. At the end of this first part, I will introduce the so-called trilemma that results from the need to satisfy conflicting requirements for the lifetime, the signal to noise ratio, and the write-ability of information simultaneously. This trilemma limits the ultimate storage density of perpendicular magnetic recording to about 1 Tbit/inch^2.

In the second part, I will show that Heat Assisted Magnetic Recording solves the trilemma by removing the write-ability limitation. Then I will present the major HAMR specific challenges for the write heads and recording media and mention the general strategies that we used at Seagate to solve them. The talk ends with a movie of a working HAMR drive - declared a viable product in 2018 and available to the general public since July 2025.

DATE: **Tuesday, 21 October 2025**

TIME: **14:30 – 15:15**

PLACE: **Building 5124, room 038,**
Aarhus University
Finlandsgade 20, 8200 Aarhus N

Virtual participation: **Link**

Danish pastry, coffee and tea will be served 15 minutes before the seminar starts.

All interested persons are invited.

Jan Becker Høgsberg