



# Summer School

July 28 - August 1 2008, Frauenchiemsee, Germany



## Adaptive Finite Elements:

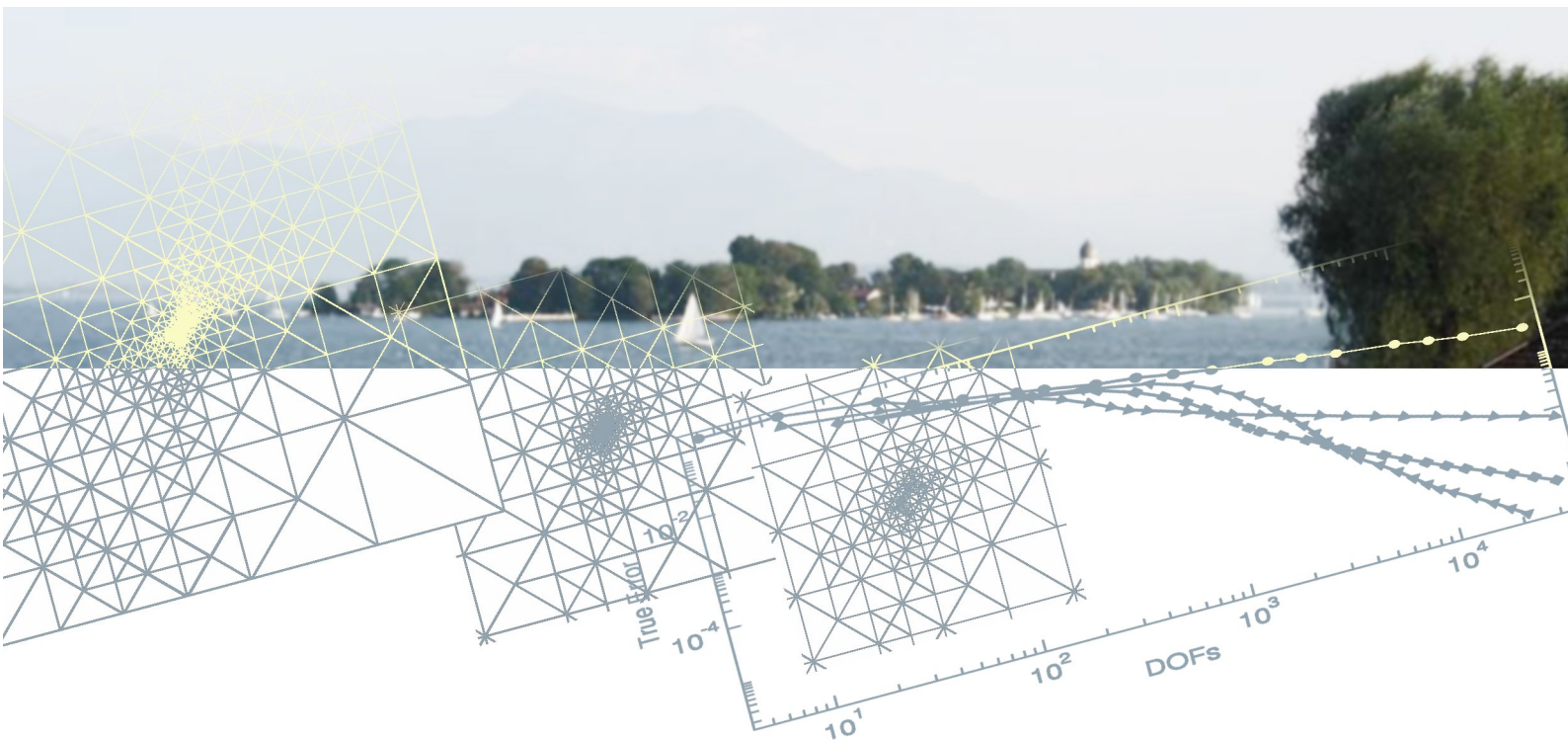
Analysis and Implementation

Organizer: Kunibert G. Siebert  
Augsburg, Germany

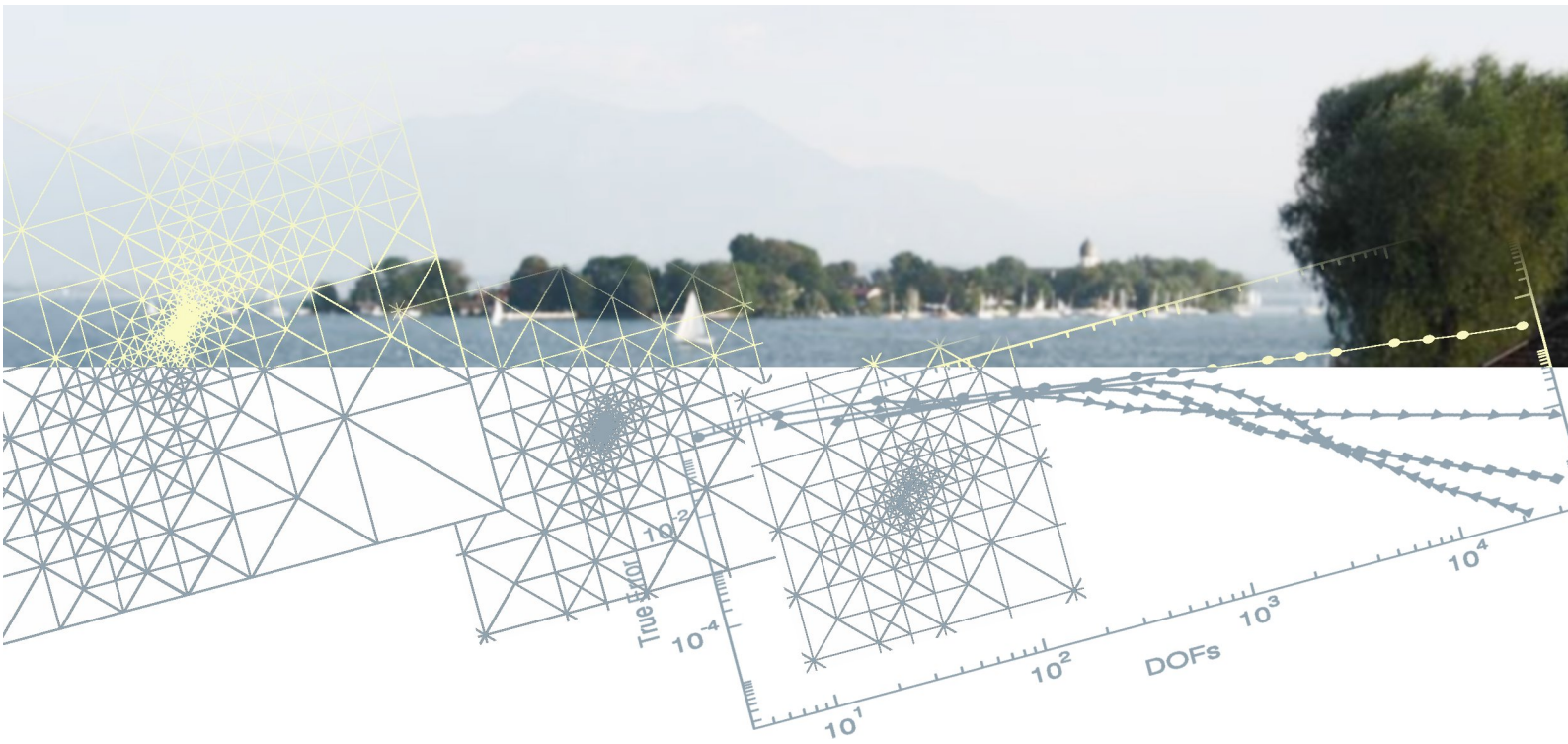
Lecturers: Pedro Morin  
Santa Fe, Argentina

Ricardo H. Nochetto  
College Park, USA

Andreas Veerer  
Milan, Italy



Please register via email to [johannes.neher@math.uni-augsburg.de](mailto:johannes.neher@math.uni-augsburg.de).  
Financial support for students can be provided upon application.



Adaptive algorithms are able to extract accuracy information from the computed solution and data and use it to improve resolution with nearly optimal computational resources. Adaptivity is often indispensable for practical solvability, especially for 3d problems.

Adaptive finite element methods (AFEM) have been used since the late 70's for the numerical solution of elliptic partial differential equations (PDE). They are based on the so-called a posteriori error estimators. Despite the rather elaborate theory of error estimation developed ever since, applicable to a variety of estimators and PDE, and the consistent computational evidence of their success, theoretical understanding of convergence and complexity of AFEM is recent and incomplete.

The objective of this summer school is to discuss thoroughly both theoretical and practical aspects of adaptivity for elliptic PDE, with emphasis on:

- The principles leading to a posteriori error estimation in the context of several popular techniques (residual, hierarchical, local problems, gradient recovery, etc);
- Convergence and complexity of AFEM in any dimension and for a variety of marking strategies and problems;
- Implementation issues of AFEM with special emphasis on 1d.

This summer school does not require a substantial knowledge of FEM, and emphasizes recent developments and open problems for future research.