

# Lothar-Collatz-Seminar

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## On Stability of Meshfree Collocation Methods

### Abstract:

Meshfree methods offer great flexibility when it comes to applications with free surface flows and complex domains. However, many properties, one of which is stability, that are intrinsic to classical mesh-based numerical methods are not a given in meshfree approaches. We will study stability using the example of the heat equation

$$\partial_t u = \nabla \cdot (\lambda \nabla u) + q$$

with a diffusion parameter  $\lambda$ . For the easiest case of  $\lambda \equiv 1$ , we will derive basic techniques to obtain a stable meshfree scheme and investigate how they transfer to more complex scenarios where  $\lambda$  is sufficiently smooth, and eventually for a discontinuous  $\lambda$ .

For further information please contact

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[www.c3s.uni-hamburg.de/news-events/seminar-c3s.html](http://www.c3s.uni-hamburg.de/news-events/seminar-c3s.html)