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Lehrstuhl für Analysis und Modellierung

**Kolloquium  
Mathematik**

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University of California at Berkeley

**Asymptotic techniques for flows with  
strong restraints: rapidly rotating  
convection**

**20. Juli 2018 - 10:30**

**8.122 (Fakultätssaal), Pfaffenwaldring 57**

Abstract: In this talk I will explain how asymptotic techniques can be used to derive reduced (i.e. simplified) equations describing flows with strong restraints. I will use rapidly rotating convection as an example, and will explain the physical, numerical and mathematical motivation behind the reduction procedure valid in the limit  $Ro \rightarrow 0$  where  $Ro \rightarrow 0$  is the convective Rossby number. I will provide a brief description of the phenomena captured by the reduced equations and the processes omitted or eliminated via the reduction procedure, as well as the validation of the resulting reduced description. I will conclude with a discussion of the advantages and the shortcomings of the procedure in providing an asymptotically exact description of flows of geophysical and astrophysical interest and highlight the mathematical issues raised by the procedure.