

# Neural Partial Differential Equations for Simple Climate Models



Freie Universität



Berlin

Use Neural Partial Differential Equations / Universal Differential Equations to combine:

$$\partial_t u(x, t) = f(u(x, t), t) + \mathcal{N}((u(x, t)))$$

knowledge-  
based

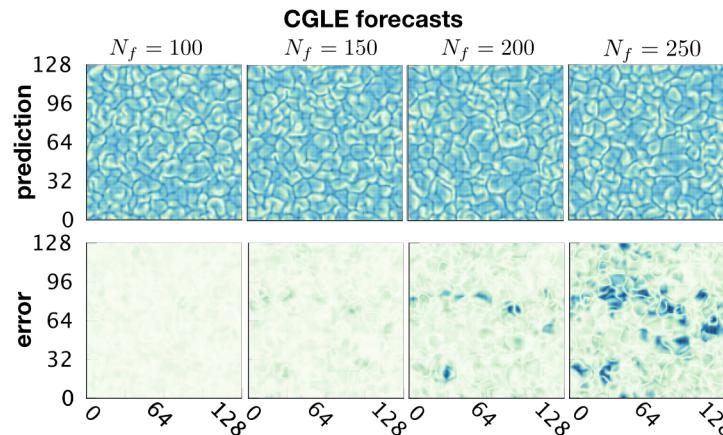
data-  
driven

article in  
NJP



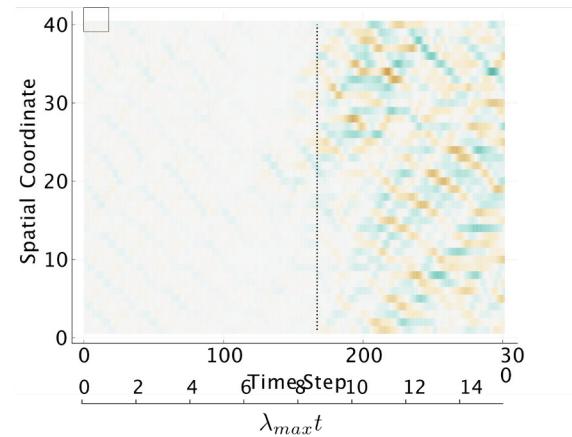
## First Success

Hybrid Forecast of Spatiotemporally Chaotic Systems, e.g Reaction-Diffusion Equations



## Current

Simple Climate Toy Model:  
Lorenz96 model + EBM  
(article soon in EPJ ST)



## Ongoing

Hybrid Atmospheric Dynamics with Marshall/Molteni QG3 Model in NPDE Formulation

