

# Oberseminar Nichtlineare Differentialgleichungen

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### **Singular nonlinear waves in mathematical models of nonlinear optics**

**30. Juni 2023 - 10:15 – Raum 8.526**

Abstract: I will overview generalizations of the nonlinear Schrodinger equation, where either the spatially decaying (solitary) waves are singular due to cusped singularities or the time evolution near solitary waves is singular. Both classes of models correspond to realms of nonlinear optics with intensity-dependent dispersion. For the models with bright solitons, I will show how weak formulations and ODE theory can be used to prove stability of solitary waves under perturbations which do not change the length between nearest singularities. For the models with black solitons, I will show how the energy, mass, and momentum conservation can be used to control perturbations in weighted Sobolev spaces.

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