

# Singularity formation in the energy-supercritical harmonic heat flow and wave maps

V. T. Nguyen

(NYU Abu Dhabi)

The talk is concerned with the energy-supercritical harmonic heat flow and wave maps from  $\mathbb{R}^d$  into the  $d$ -sphere  $\mathbb{S}^d$  with  $d \geq 7$ . Under the assumption of 1-corotational symmetry, the problems reduce to the simplified equations

$$\partial_t u = \partial_r^2 u + \frac{d-1}{r} \partial_r u - \frac{(d-1)}{2r^2} \sin(2u), \quad (\text{HF})$$

$$\partial_t^2 u = \partial_r^2 u + \frac{d-1}{r} \partial_r u - \frac{(d-1)}{2r^2} \sin(2u). \quad (\text{WM})$$

I will present a two-step procedure based on a robust universal energy method and modulation techniques for constructing Type II blowup solutions to these equations with a precise description of its profiles. This talk is based on the following joint works with S. Ibrahim and T. Ghoul:

[1] S. Ibrahim, T. Ghoul and V. T. Nguyen, **On the stability of type II blowup for the 1-corotational energy supercritical harmonic heat flow**. *Anal. PDE*, 12(1): 113–187, 2019. [\[DOI\]](#).

[2] S. Ibrahim, T. Ghoul and V. T. Nguyen, **Construction of type II blowup solutions for the 1-corotational energy supercritical wave maps**. *J. Differential Equations* 265(7): 2968–3047, 2018. [\[DOI\]](#).