

# A non-compactness result on the fractional Yamabe problem in large dimensions

Seunghyeok Kim

Pontificia Universidad Católica de Chile  
shkim0401@gmail.com

Let  $(X^{n+1}, g^+)$  be an  $(n + 1)$ -dimensional asymptotically hyperbolic manifold with a conformal infinity  $(M^n, [\hat{h}])$ . The aim of this talk is to discuss the compactness issue on the fractional Yamabe equation

$$P^\gamma[g^+, \hat{h}](u) = u^{\frac{n+2\gamma}{n-2\gamma}}, \quad u > 0 \quad \text{on } M$$

where  $P^\gamma[g^+, \hat{h}]$  is the fractional conformal Laplacian whose leading term is  $(-\Delta)^\gamma$ . Precisely, we show that there is an asymptotically hyperbolic metric  $g^+$  on the half space  $X = \mathbb{R}_+^{n+1}$ , which is conformally equivalent to the unit ball  $B^{n+1}$ , for which the solution set of the fractional Yamabe equation is non-compact provided that the dimension  $n$  is sufficiently high. We will also observe that the optimal dimension  $n$  which gives rise to blow-up solutions depends on  $\gamma \in (0, 1)$ . This is a joint work with Monica Musso (PUC, Chile) and Juncheng Wei (UBC, Canada).