

**VENTOTENE INTERNATIONAL WORKSHOPS VI  
GRAZP: GROUPS AND RIGIDITY AROUND THE ZIMMER PROGRAM  
VENTOTENE, 11-16 SEPTEMBER 2023**

$\theta$ -POSITIVE REPRESENTATIONS

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Surprisingly, there exist connected components of character varieties of fundamental groups of surfaces in semisimple Lie groups consisting only of injective representations with discrete image. Guichard and Wienhard introduced the notion of  $\theta$ -positive representations as a conjectural framework to explain this phenomenon. I will discuss joint work with Beyrer and Beyrer-Labourie-Guichard-Wienhard in which we establish several geometric properties of  $\theta$ -positive representations. As an application, we deduce that they indeed form connected components of character varieties.