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# Representation and Number Theory Seminar

## A proof of $P = W$ conjecture

by

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### Abstract

Let  $C$  be a smooth projective curve. The non-abelian Hodge theory of Simpson is a homeomorphism between the character variety  $M_B$  of  $C$  and the moduli of (semi) stable Higgs bundles  $M_D$  on  $C$ . Since this homeomorphism is not algebraic, it induces an isomorphism of cohomology rings, but does not preserve finer information, such as the weightfiltration. Based on computations in small rank, de Cataldo-Hausel-Migliorini conjectured that the weight filtration on  $H^*(M_B)$  gets sent to the perverse filtration on  $H^*(M_D)$ , associated to the Hitchin map. In this talk, I will explain a recent proof of this conjecture, which crucially uses the action of Hecke correspondences on  $H^*(M_D)$ . Based on joint work with T. Hausel, A. Mellit, O. Schiffmann.

<b>Date</b>	<b>: 9 May, 2023 (Tuesday)</b>
<b>Time</b>	<b>: 2:00pm - 3:00pm</b>
<b>Venue</b>	<b>: Room 222, Lady Shaw Building The Chinese University of Hong Kong</b>

*All are Welcome*