Thursday, August 18, 2022

12:00pm-1:00pm  **Topology** -- Andrea Bianchi (University of Copenhagen) *Non-trivial action of the Johnson filtration on the homology of configuration spaces* -- 4096 East Hall
Abstracts for the week of August 14th, 2022 - August 20th, 2022

Topology
Thursday, August 18, 2022, 12:00pm-1:00pm
4096 East Hall
Andrea Bianchi (University of Copenhagen)

Non-trivial action of the Johnson filtration on the homology of configuration spaces

This is joint work with Andreas Stavrou. Let $S$ be a compact, connected, orientable surface, possibly with boundary, and let $F_n(S)$ denote the space of ordered configurations of $n$ distinct points in $S$. The homology groups $H_*(F_n(S))$ admit a natural action of the mapping class group $Mod(S)=\pi_0(Diff_+(S,dS))$, and we are interested in how non-trivial this action is.

For $S=S_{g,1}$, we consider the Johnson filtration on $Mod(S)$ by subgroups $J(i)$, for $i\geq 0$. For $g\geq 2$, we prove that there are mapping classes in $J(n-1)$ that act non-trivially on $H_*(F_n(S))$; this should be compared with a previous result of Miller, Wilson and myself, ensuring that each mapping class in the smaller subgroup $J(n)$ acts trivially on $H_*(F_n(S))$.

Similarly, for $S=S_g$, we consider an analogue of the Johnson filtration on $Mod(S)$, and prove for $g\geq 3$ that $J(n-1)$ admits elements acting non-trivially on $H_*(F_{n+1}(S_g))$.

I will sketch the proof of these statements, focusing on the construction of homology classes in $H_*(F_n(S))$. 