1046-57-1010 **Alexander Fel'shtyn*** (felshtyn@diamond.boisestate.edu), 1910 University Drive, Boise, ID 83725-1555. *How to categorify dynamical zeta functions.* Preliminary report.

A programm of a categorification a la Khovanov of Weil type dynamical zeta functions is proposed.

**Theorem** Let $\phi : \Sigma \to \Sigma$ be a symplectomorphism of a compact surface. Then the Weil zeta function is a graded Euler characteristic

$$L_\phi(z) := \exp\left(\sum_{n=1}^{\infty} \frac{L(\phi^n)}{n} z^n\right) = \sum_{d=0}^{\infty} L(S^d(\phi)) z^d = \sum_{d=0}^{\infty} \chi(\phi, d) z^d = \chi(\phi, z),$$

where $L(\phi^n), L(S^d(\phi))$ are Lefschetz numbers, $S^d(\phi) : S^d(\Sigma) \to S^d(\Sigma)$ is induced map on $d$-fold symmetric power of $\Sigma$ and

$$\chi(\phi, d) = \chi(PFH(\phi, d)) = \chi(ECH(T_\phi, s_d)) = \chi(SWF(T_\phi, s_d)) = \chi(HF^+(T_\phi, s_d))$$

is the Euler characteristic of the periodic Floer homology of degree $d$ or of the embedded contact homology of the mapping torus $T_\phi$ for $Spin^c$-structure $s_d$, or the Euler characteristic of the corresponding Seiberg-Witten-Floer or Ozsvath-Szabo homology of $(T_\phi, s_d)$)

There is a strong indication that $SWF(T_\phi, s_d)$ cohomology provide a categorification of the Nielsen periodic point theory and corresponding minimal zeta function.

There are intriguing questions about categorification of arithmetic zeta functions. (Received September 15, 2008)