1096-17-2649 **Krzysztof Karol Putyra*** (putyra@math.columbia.edu). *The many versions of odd Khovanov homology.* Preliminary report.

Khovanov homology is a link invariant that categorifies Jones polynomial. After it was defined by Khovanov in 1999, many other versions appeared: an embedded homology (Caprau-Stroppel), extensions for virtual links (Manturov) and tangles (Khovanov, Bar-Natan), a deformation by Lee and a theory based on dotted cobordisms (Bar-Natan) that was proven to be the universal one (Khovanov). The last one is also defined for knots in surfaces. Another extension to knots in surfaces was explored by Asada-Sikora-Przytycki. On the other hand, the odd Khovanov homology, defined by Ozsvath-Rasmussen-Szabo in 2007 has a different flavor and does not fit into any of the frameworks above.

In my talk I will show how to construct a theory covering both odd and ordinary homology and how to extend it for tangles. The key point is to use 2-categorical structure of cobordisms, pseudo-functorial tensor products and quasi-rings, i.e. rings that are associative only up to a sign. If time permits, I will also demonstrate how to obtain odd versions of embedded homology. The case of virtual links is still open. (Received September 17, 2013)