**Khovanov Homology**

**What is it?**
A cube for each knot/link projection;
Vertices: All fillings of with or with .
Edges: All fillings of with or with .

**Where does it live?**
In In Kom(Mat(<Cob> / {S, T, 4Tu})) / homotopy :
Kom: Complexes Cob: Cobordisms <...>: Formal lin. comb. Mat: Matrices
S: =0 T: =2

**Jones/Kauffman?**
A TQFT takes it to a complex whose graded Euler characteristic is the Jones polynomial.
The key point: 

**Why is it interesting?**
1. It is stronger than the Jones polynomial.
2. It is less understood than the Jones polynomial:
a. Does it have a topological interpretation?
b. Does it have a "physical" interpretation?
c. Does it also work for other quantum invariants?
d. Does it work for manifolds and for knots in manifolds?
e. Is there a relation with finite-type invariants?
f. Does it work for "virtual knots"?
3. Jacobsson, Khovanov: It is a functor!!!
(From knots and cobordisms to complexes and morphisms)

**But is it invariant?**
(With similar proofs for R–II and R–III)

**A functor?**

**A canopoly?**

**More crossings?**

**Signs?**

**See**
http://www.math.toronto.edu/~drorbn/papers/Cobordism