

### Lecture 37

Fundamental group and cell complexes.

Complexes of  $\mathbb{Z}[\pi_1]$ -modules.

Representations  $\rho: \pi_1 \rightarrow GL(n, \mathbb{C})$  and twisted homology.

### Lecture 38

Fundamental group and homology.

Twisted homology. Morse-type inequalities

for any  $\rho: \pi_1 \rightarrow GL(n, \mathbb{C})$

### Lecture 39

Representations with trivial homology.

Reidemeister determinant ("torsion")

~~for all~~  $\pi_1$ -cell decomposition for the 3-dimensional lens manifolds.

### Lecture 40

Reidemeister torsion and lens manifolds.

### Lecture 41

2-dimensional cell complexes with only 1 0-cell. Their fundamental

group.  $\mathbb{Z}[\pi_1]$ -complex (universal covering), its calculation. Alexander polynomial for knots.