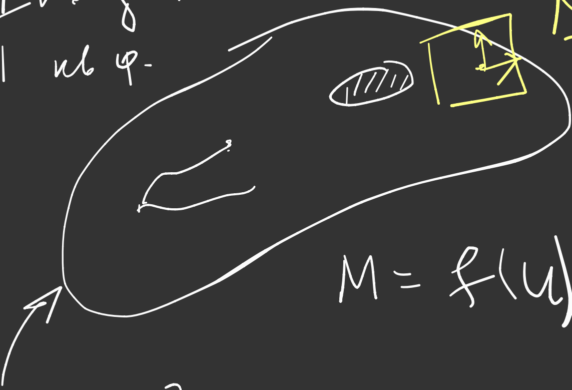
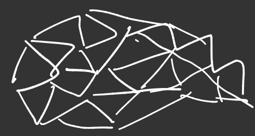
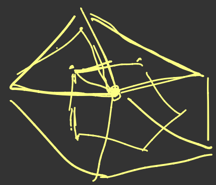
Гладкий мир | Лапласиан Laplacian | Дискретный мир

I инвар. ф.
II инв. ф.

$\Delta \rightsquigarrow L$

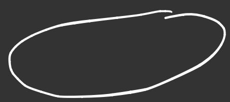




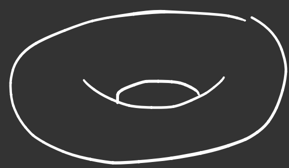


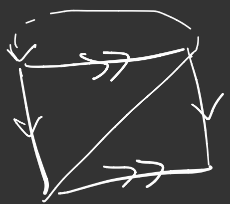
$M = f(U)$

$f: U \to \mathbb{R}^3$



"Триангуляция" мн-я M = симплиц. комплекс $\cong M$

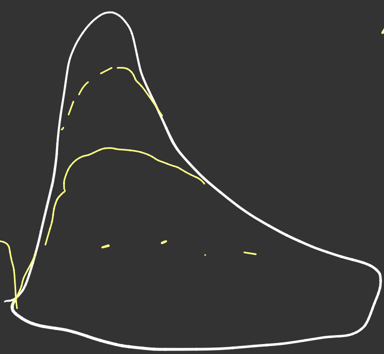




$\pi_1(M)$ $\pi_n(M)$
$H_n(M, \mathbb{Z})$

$f \in C^\infty(\mathbb{R}^n)$ $f \in C^\infty(M)$?

$$\Delta f = \sum_{i=1}^{n} \frac{\partial^2 f}{\partial x_i^2}$$

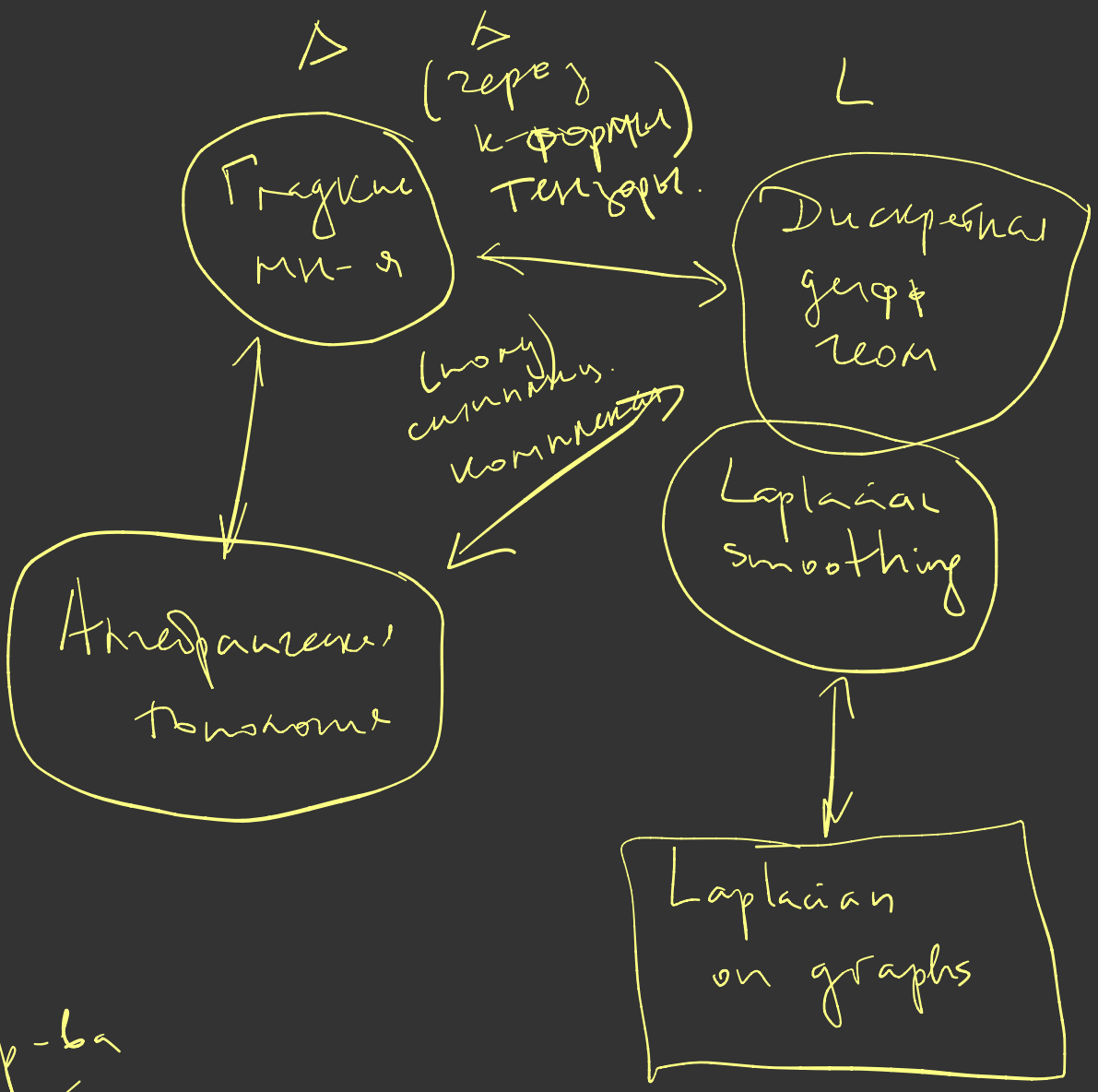


$$T^{j_1 \ldots j_q}_{i_1 \ldots i_p}(x) = \ldots$$

$S^n \simeq S^m$
$\Updownarrow$
$n = m$

$V = \langle e_1, \ldots, e_n \rangle$

$V^* = \langle f_1, \ldots, f_n \rangle$ $f_i(e_j) = \begin{cases} 1 & i=j \\ 0 & i \neq j \end{cases}$



Пр-ва постоянной кривизны

E^n, S^n, H^n

0 1 -1

graph

Хроматическое число ⟷ Лапласиан