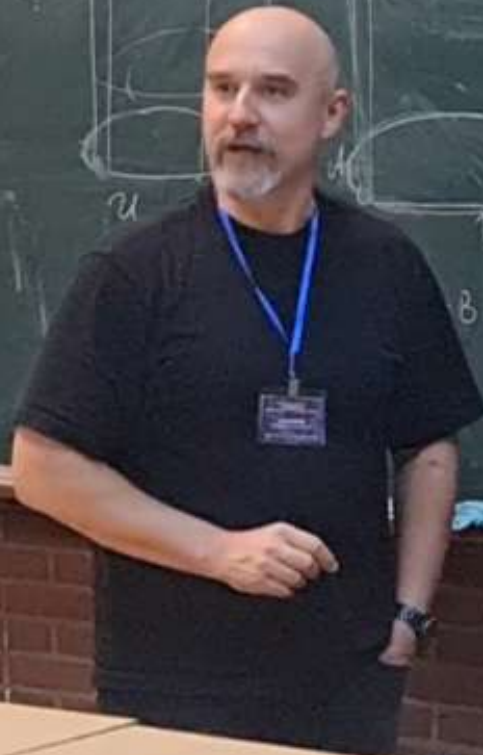


$F \in \mathcal{O}_X(M)$   
 $dF = 0$   
 Let  $(E, \pi, S) \rightarrow (E', \pi', B)$  be two fibrations over  $B$   
 Mapping  $(E, \pi, S) \rightarrow (E', \pi', B)$  is  
 (locally isomorphic)  
 $\forall x \in B, \exists U \text{ open } : \exists f \in \text{Diff}(\mathbb{R}^n, \mathbb{R}^n)$   
 $\begin{matrix} \mathbb{R}^n & \xrightarrow{f} & \mathbb{R}^n \\ \downarrow \pi & & \downarrow \pi' \\ U & \xrightarrow{f|_U} & U' \end{matrix}$   
 $g_1(x) = g_1'(x) \circ f^{-1}$   
 $g_2(x) = g_2'(x) \circ f^{-1}$   
 $x \in \mathcal{O}_x$

Prop 1.32/1.37  $\pi: U \rightarrow M$   
 $e^{iS(x)} (1 + \mathcal{O}(\hbar)) = \langle \mathcal{X}(A) | \mathcal{X}(B) \rangle$   
 A fiber bundle over  $B$  with fibers  $F_1, \dots, F_n$   
 is a fibration  $(E, \pi, B)$  over  $B$   
 s.t.  $(E, \pi, B) \simeq_{\text{loc}} (B \times F, \text{pr}_1, B)$   
 $\star \mathcal{X}(A) = \mathcal{X}(A)$   
 $(f_1 - f_2 + f_3) \log = g_1 \circ \mathcal{X}(A)$   
 trivial fibration over  $B$  with fiber  $F$   
 $\mathbb{Z} \subset \mathbb{R}$



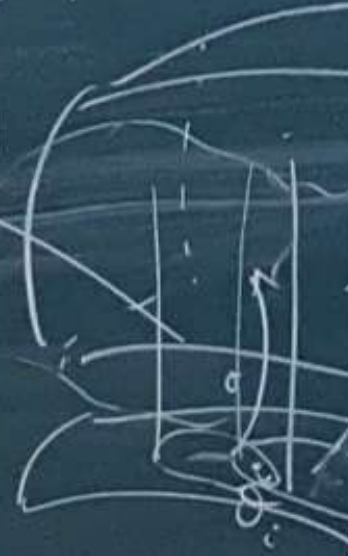


$$\begin{aligned}
 g_{ij} \cdot \partial_j &\rightarrow D_i \backslash (F) \\
 &\rightarrow G \text{ STR. GROUP} \\
 \tau_i \circ \tau_j^{-1} : \partial_j \times F &\rightarrow \partial_i \times F \\
 (x, f) &\mapsto (x, g_{ij}(x)(f)) \\
 &\downarrow \downarrow \downarrow \\
 &B \\
 &\downarrow \\
 &\partial_i \times F
 \end{aligned}$$

$\pi^{-1}(\partial_i) \cong \partial_i \times F$

$\tau_i$

$\tau_i \circ \tau_j^{-1} \circ (\tau_j \circ \tau_i^{-1})$





Let  $(E, \pi, B)$  &  $(E', \pi', B)$  be two fibrations over  $B$

We say that  $(E, \pi, B) \simeq_{loc} (E', \pi', B)$  if

(local isomorphism)

$\forall b \in B \exists U \ni b, \exists$

$$\begin{pmatrix} \pi^{-1}(U) \\ \pi'^{-1}(U) \end{pmatrix} \xrightarrow{\cong} E'$$

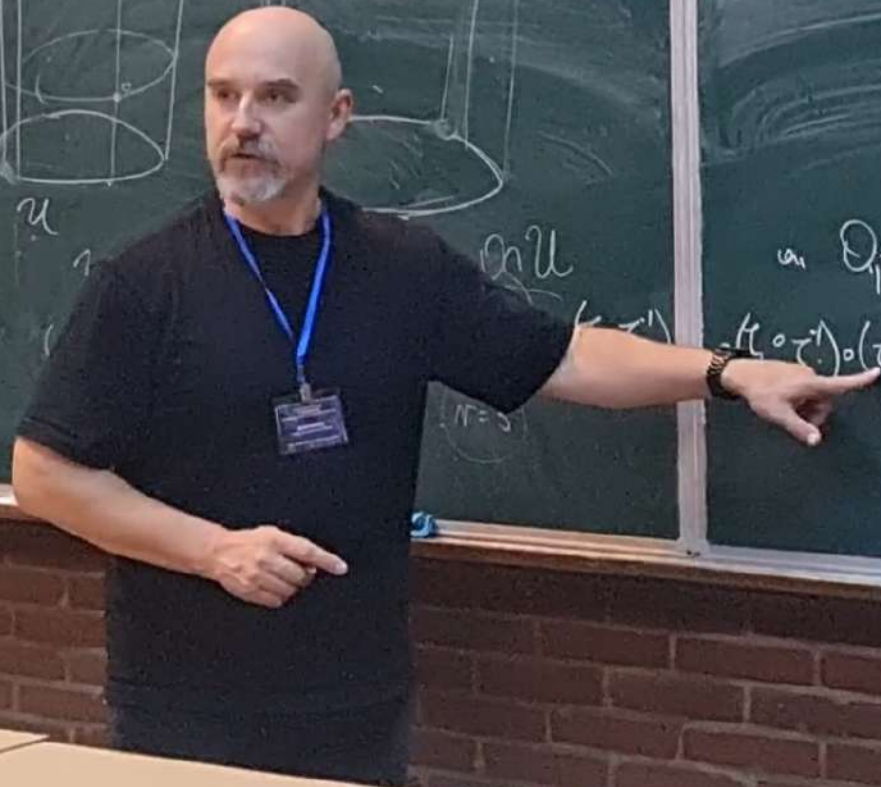
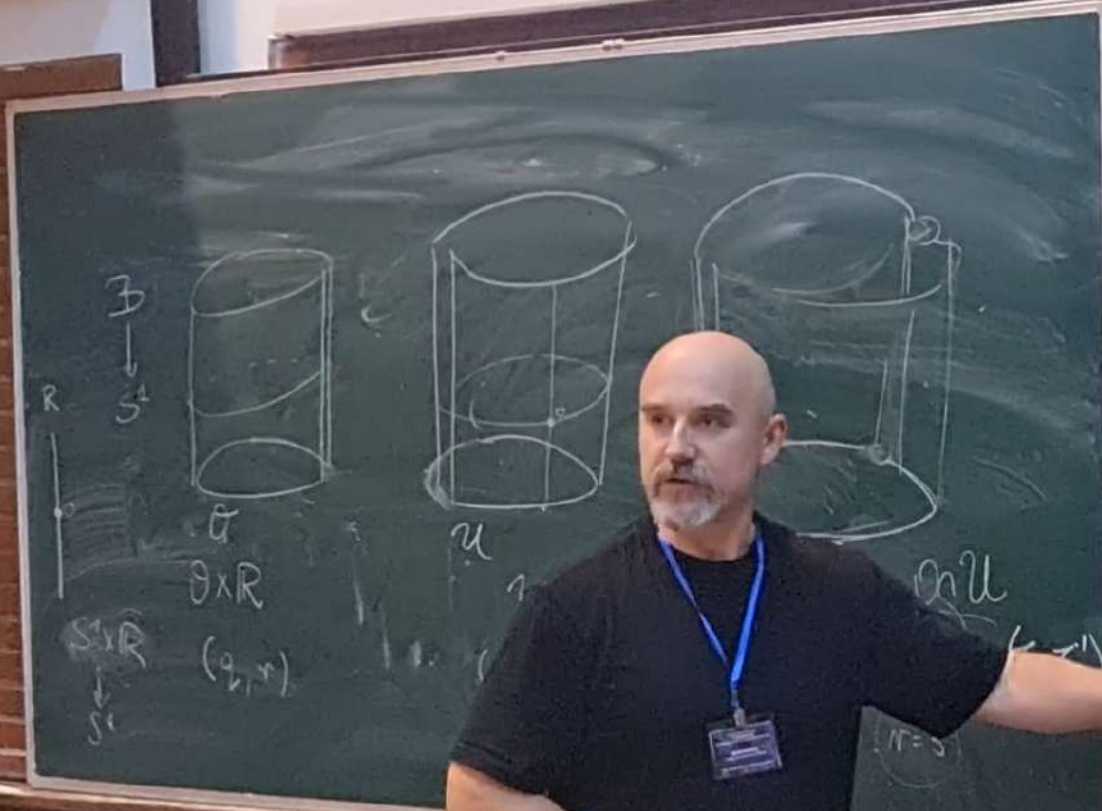


$\equiv$  A fiber bundle over  $B$  with fiber  $F$  is a fibration  $(E, \pi, B)$  over  $B$  with fiber  $F$

a fibration  $(E, \pi, B)$  over  $B$  is a fibration

s.t.  $(E, \pi, B) \simeq_{loc} (B \times F, p, B)$

trivial fibration over  $B$  with fiber  $F$



$$\begin{aligned}
 &g_i: \mathcal{O}_i \rightarrow \text{Diff}(F) \\
 &\downarrow \tau_i \\
 &\mathcal{O}_i \times F \rightarrow \mathcal{O}_i \times F \\
 &\downarrow \tau_i \\
 &\mathcal{O}_i \times F
 \end{aligned}$$

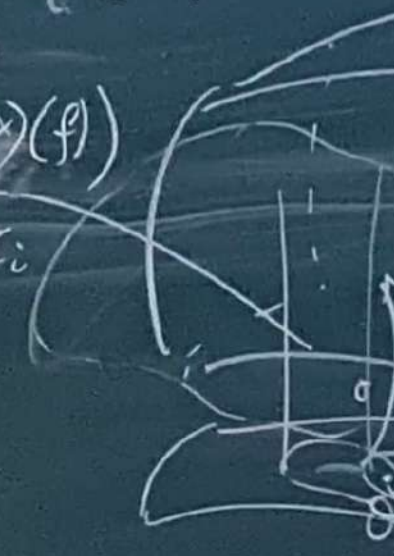
$\tau_i: \pi^{-1}(\mathcal{O}_i) \xrightarrow{\cong} \mathcal{O}_i \times F$

$(x, f) \mapsto (x, \tau_i(x)(f))$

$\tau_i$

$\mathcal{O}_i \times F$

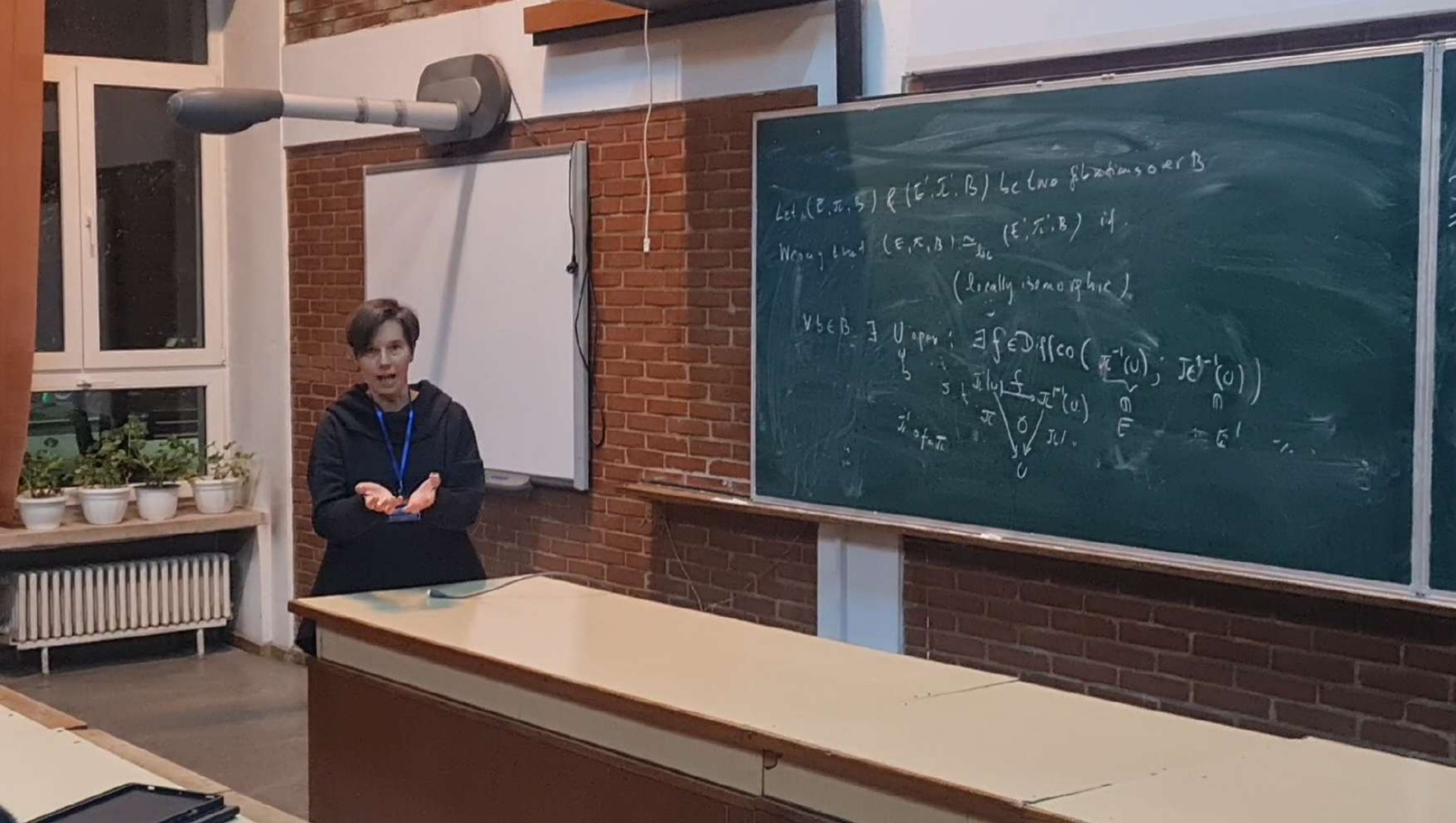
$\tau_i \circ \tau_i^{-1} = (\tau_i \circ \tau_i^{-1})$





Let  $(E, \pi, S)$  &  $(E', \pi', B)$  be two fibrations over  $B$   
 We say that  $(E, \pi, B) \cong_{loc} (E', \pi', B)$  if  
 (locally isomorphic).

$\forall b \in B \exists U \text{ open } \exists f \in \text{Diff}(co(\pi^{-1}(U), \pi'^{-1}(U)))$   
 $\begin{matrix} U & \xrightarrow{f} & U \\ \pi \downarrow & & \downarrow \pi' \\ S & \xrightarrow{f} & S \end{matrix}$   
 $\pi \circ f = \pi'$



Let  $(E, \pi, B) \leftarrow (E', \pi', B)$  be two fibrations over  $B$

We say that  $(E, \pi, B) \simeq_{loc} (E', \pi', B)$  if

(locally isomorphic)

$\forall b \in B, \exists U \text{ open } \ni b \text{ s.t. } \exists f \in \text{Diff}(E|_U, E'|_U)$   
 $\begin{array}{ccc} \psi & & \\ \downarrow & & \\ \text{map } U & \xrightarrow{f} & \text{map } U \\ \downarrow \pi & & \downarrow \pi' \\ U & & U \end{array}$   
 $\text{map } U \xrightarrow{\pi} U$   
 $\text{map } U \xrightarrow{\pi'} U$   
 $\text{map } U \xrightarrow{\pi^{-1}(U)} E|_U$   
 $\text{map } U \xrightarrow{\pi'^{-1}(U)} E'|_U$