

GEOMETRISATION of $\mathbb{H}^*(X, \mathbb{Z}G)$
(Maczey, Skovron)

NERVE of \mathcal{O}_2
 $N_*(\mathbb{U}\mathcal{O}_2 \rightrightarrows \mathbb{U}\mathcal{O}) = \mathbb{U}\mathcal{O} \rightrightarrows \mathbb{U}\mathcal{O}_2 \rightrightarrows \mathbb{U}\mathcal{O}_2 \rightrightarrows \mathbb{U}\mathcal{O}_2 \rightrightarrows \mathbb{U}\mathcal{O}_2 \rightrightarrows \mathbb{U}\mathcal{O}_2$

NERVE of $\text{Pair}_2(YX)$
 $N_*(Y^{\text{ob}}X \rightrightarrows YX) = Y^{\text{ob}}X \rightrightarrows Y^{\text{ob}}X \rightrightarrows Y^{\text{ob}}X \rightrightarrows YX, B$

CONCRETE
 $\text{Pair}_2(YX) = \text{Pair}_2(YX) = \text{Pair}_2(YX)$

ABSTRACTION
 $X, H \in \mathbb{Z}^3(X)$

GEOMETRISATION
 $G_d = (YX, B, L, A, \mu)$

0-GERBE + CUBATURE H

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BD-HYPERHOMOLOGICAL EQUIVALENCES ARISE AS BUNDLE-LIKE STRUCTURES
 OVER COMMON REFINEMENT OF RESPECTIVE COVERS

$\Rightarrow G_1 = (Y, X, B_1, L_1, A_1, M_1) \cong G_2 = (Y, X, B_2, L_2, A_2, M_2) \cong G_3$ GEOMETRIES AS

$\mathbb{E} = (Y, X \rightrightarrows Y, X, E, A_1, A_2) \cong Y, X$

$\pi_1^*(p_1^*B_1 - p_2^*B_2) = dA_1$

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BD-HYPERHOMOLOGICAL EQUIVALENCES ARISE AS BUNDLE-LIKE STIMULATORS
 OVER COMMON REFINEMENT OF RESPECTIVE COVERS

$\Rightarrow G_1 = (Y, X, B_1, L_1, A_1, M_1) \simeq (Y, X, B_2, L_2, A_2, M_2) \simeq G_2$

GEOMETRIER AC

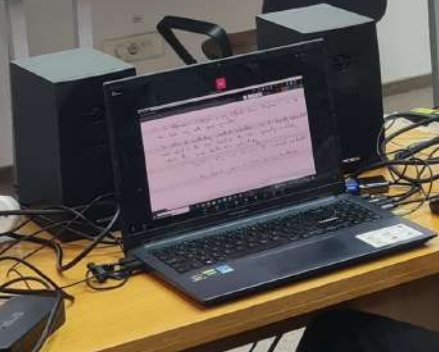
$\mathbb{E} = (Y, X, s, Y, X, E, A_E, M_E) \in Y, X$

$\pi_0^*(p_1^* B_1 - p_2^* B_2) = dA_E$

(34)



!!! The deformation technique is very different from Uspenski's as he
only deals only with group symmetries.
The problem of constructing central extensions can be directly reformulated
and asked in the best context as the best symmetry completely
capture the group structure of a given theory

$$\text{Set}^{\mathbb{Z}_2}, \mathbb{Z}_2 \rightarrow \mathbb{Z} \rightarrow \mathbb{Z} \text{ (codified-subalgebra)}$$
$$\mathbb{Z}, \mathbb{Q}_{10} \rightarrow \mathbb{Z} \rightarrow \mathbb{H}_2 \text{ (non-linear)}$$








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Dr. G. Lyndon

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JORDIA

The cosmological equation and geometric dynamical system

Define the *Hubble parameter* $H(t) \stackrel{\text{def}}{=} \frac{\dot{a}(t)}{a(t)}$ and the *rescaled Hubble function*:

$$\mathcal{H} : TM \rightarrow \mathbb{R}_{>0}, \quad \mathcal{H}(u) \stackrel{\text{def}}{=} \sqrt{\|u\|^2 + 2V(\pi(u))} \quad \forall u \in TM,$$

where $\pi : TM \rightarrow M$ is the bundle projection.

Proposition

When $H > 0$, the equations of motion are equivalent with the cosmological equation:

$$\nabla_{\dot{\varphi}} \ddot{\varphi}(t) + \frac{1}{M_0} H(\dot{\varphi}(t)) \dot{\varphi}(t) + (\text{grad}_g V)(\dot{\varphi}(t)) = 0,$$

together with the Hubble condition:

$$H(t) = \frac{1}{3M_0} H(\dot{\varphi}(t)).$$

The solutions $\varphi : I \rightarrow M$ of the cosmological equation are called *cosmological curves*. The cosmological equation defines an autonomous dissipative geometric dynamical system on TM . Any cosmological curve φ defines a *cosmological orbit* $\mathcal{O}_\varphi : I \rightarrow TM$ given by $\mathcal{O}_\varphi(t) \stackrel{\text{def}}{=} (\varphi(t), \dot{\varphi}(t))$, which describes the *state evolution* of this dynamical system.





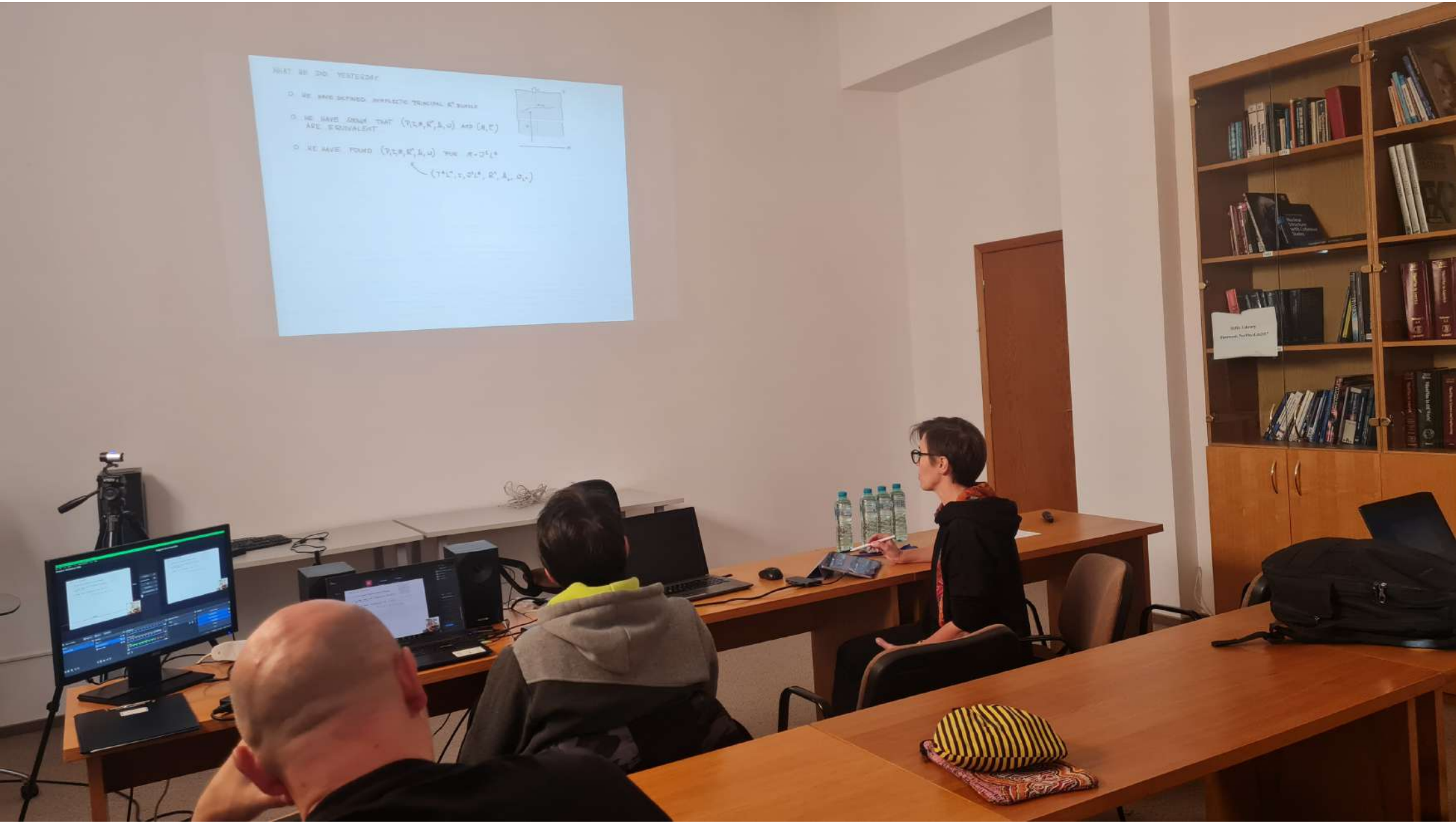







WHAT WE DID YESTERDAY

- WE HAVE DEFINED IMPROVED TERMINAL R-SUMS
- WE HAVE DONE THAT $(\mathcal{P}, \mathcal{R}, \mathcal{A}, \mathcal{U})$ AND $(\mathcal{R}, \mathcal{C})$ ARE EQUIVALENT
- WE HAVE FOUND $(\mathcal{P}, \mathcal{R}, \mathcal{A}, \mathcal{U})$ FOR $\mathcal{R} = \mathcal{D}^{\text{int}}$
 $\leftarrow (\mathcal{P}^{\text{int}}, \mathcal{D}^{\text{int}}, \mathcal{R}, \mathcal{A}, \mathcal{U})$



UPSHOT: $T(M) = \bigsqcup_{\mathbb{R}} \mathbb{D}_2 \times \mathbb{C} / \sim_{\mathbb{C}}$ CAN BE EQUIPPED w/ CONNECTION + CURVATURE = PREQUANTUM FOLIATION (SERVED BY 1st ORDER TERMOLOGICAL)

NB: 1-ISOMORPHISMS $\eta = (P, A)$ TRANSFER TO VERTICAL AUTOMORPHISMS of $T(M)$
 $G_{g,2} \mapsto H_1(G_{g,2}, H_2) , H_2[x] = \prod_{x \in X} \exp(\int_{x_0}^x P_{i_1}) \prod_{x \in X} h_{\dots}(x)$

IMPLICATION: PREQUANTISABLE MODELS of CHARGED-LOOP DYNAMICS in BACKGROUND (X, g, H) CLASSIFIED by $\check{H}^*(X, U(1))$

\Rightarrow NEED to STUDY HIGHER GEOMETRY of GERBES!

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UPSHOT: $T(\omega) \equiv \bigsqcup_{\mathcal{G}} \mathcal{G}_1 \times \mathbb{C} / \sim_{\mathcal{G}}$ CAN BE EQUIPPED w/ CONNECTION of OPERATORS
 = PRESYMPLECTIC FORM of 2d LFT
(derived in 1st ORDER FORMALISM (Dijkgraaf-Witten))

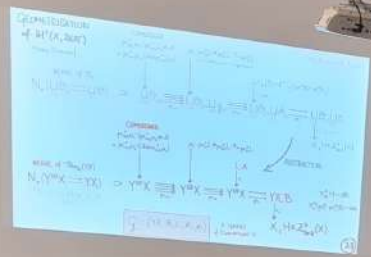
NB: 1-ISOMORPHISMS $\eta = (P, h)$ TRANSPRESS TO VERTICAL AUTOEOMORPHISMS of $T(\omega)$
 $\mathcal{G}_{2,d} \mapsto H_2(\mathcal{G}_{2,d}, H_{\mathbb{Z}}^1)$, $H_2(\mathbb{R}) = \prod_{\text{all } \mathcal{G}_1} \exp(i \int_{\mathcal{G}_1} \eta) \cdot \prod_{\text{all } \mathcal{G}_1} h_{\text{vertical}}(\eta)$

IMPLICATION: **FREQUANTISABLE MODELS of CHARGED-LOOP DYNAMICS**
 in BACKGROUND (X, g, H) CLASSIFIED by $\tilde{H}^*(X, U(1))$

\Rightarrow NEED to STUDY HIGHER GEOMETRY of GERBES!

(32)







BD-HYPERCOHOMOLOGICAL EQUIVALENCES ARISE AS BUNDLE-LIKE STRUCTURES
 OVER COMMON REFINEMENT OF RESPECTIVE COVERS

$\Rightarrow G_1 = (Y, X, B_1, L_1, A_1, M_1) \simeq (Y, X, B_2, L_2, A_2, M_2) = G_2$ GEOMETRIES AC

$$\mathcal{E} = (Y, X, \pi_Y, \pi_X, F, A_E, \theta_E)$$

$$\simeq Y, X$$

$\pi_Y^*(\pi_X^* B_2 - \pi_X^* B_1) = dA_E$

(34)

