

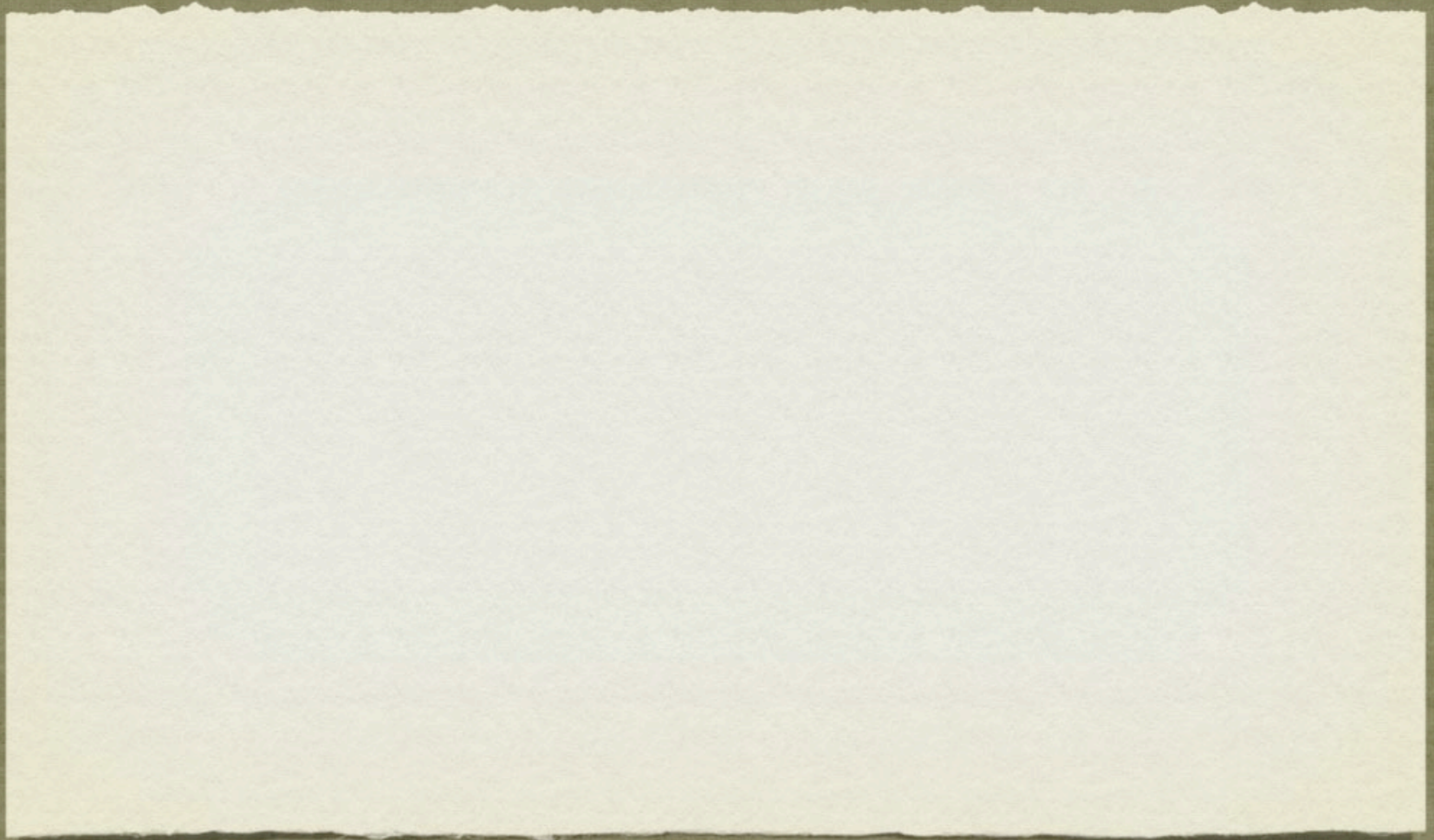
EXCHANGE EXPERIENCES ABROAD



José Fonseca
BIEP Visitor at YITP



BIEP



BIEP

- GCOE Bilateral International Exchange Program;

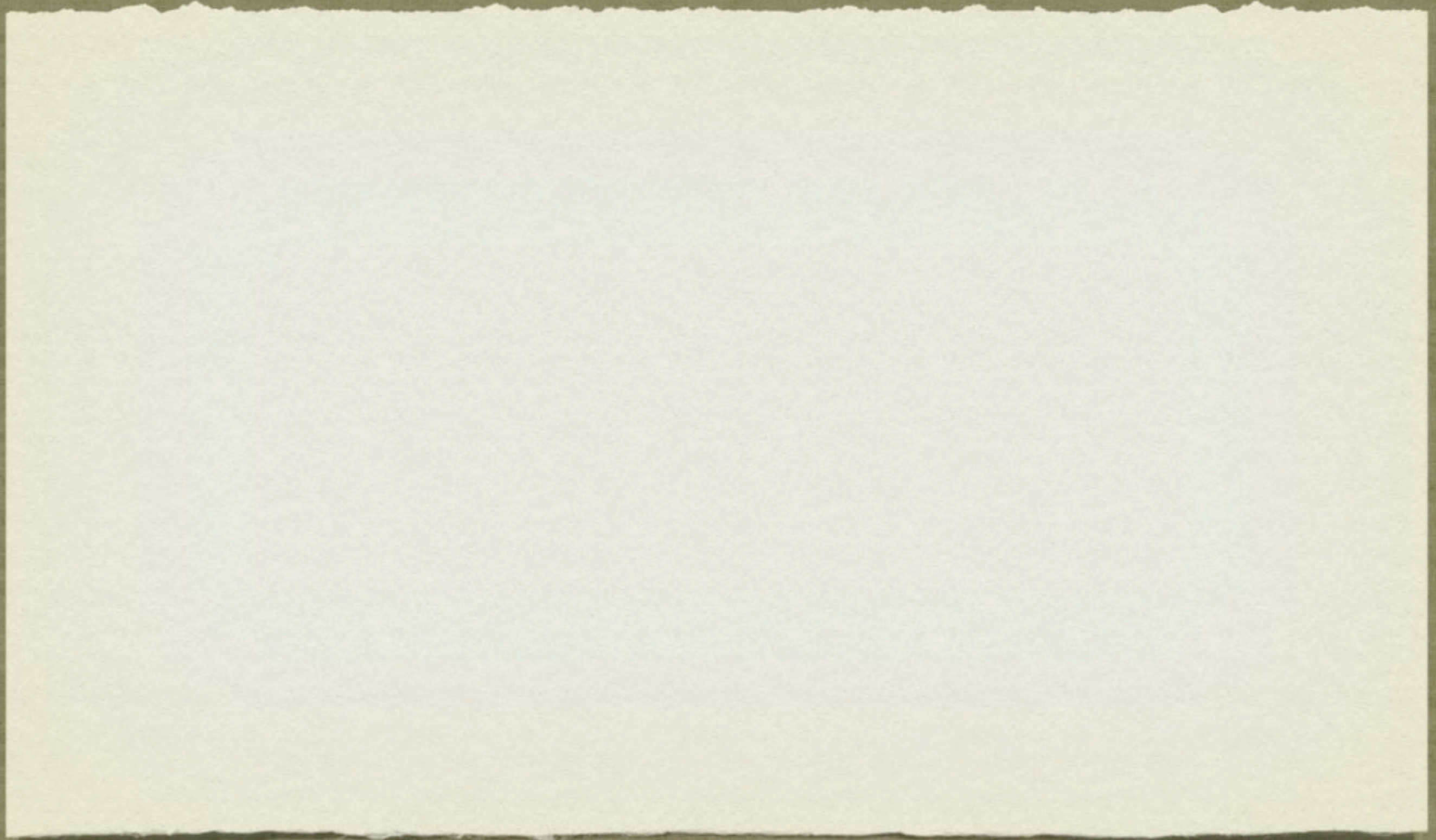
BIEP

- GCOE Bilateral International Exchange Program;
- Is for graduate students and young researchers in physics of a foreign institution to experience the research atmosphere in Kyoto. And for Kyoto students to have a research experience abroad;

BIEP

- GCOE Bilateral International Exchange Program;
- Is for graduate students and young researchers in physics of a foreign institution to experience the research atmosphere in Kyoto. And for Kyoto students to have a research experience abroad;
- Why should you apply for it?

BIEP



BIEP

- 1st: You may want to study some field/subject that no one works in your department, faculty, research institute, etc;

BIEP

- 1st: You may want to study some field/subject that no one works in your department, faculty, research institute, etc;
- 2nd: You can get in touch with different points of view/interpretations of the same research field;

BIEP

- 1st: You may want to study some field/subject that no one works in your department, faculty, research institute, etc;
- 2nd: You can get in touch with different points of view/interpretations of the same research field;
- 3rd: One can practise/learn English and another foreign language;

BIEP

- 1st: You may want to study some field/subject that no one works in your department, faculty, research institute, etc;
- 2nd: You can get in touch with different points of view/interpretations of the same research field;
- 3rd: One can practise/learn English and another foreign language;
- 4th: The opportunity to live abroad and the cultural exchange;

BIEP

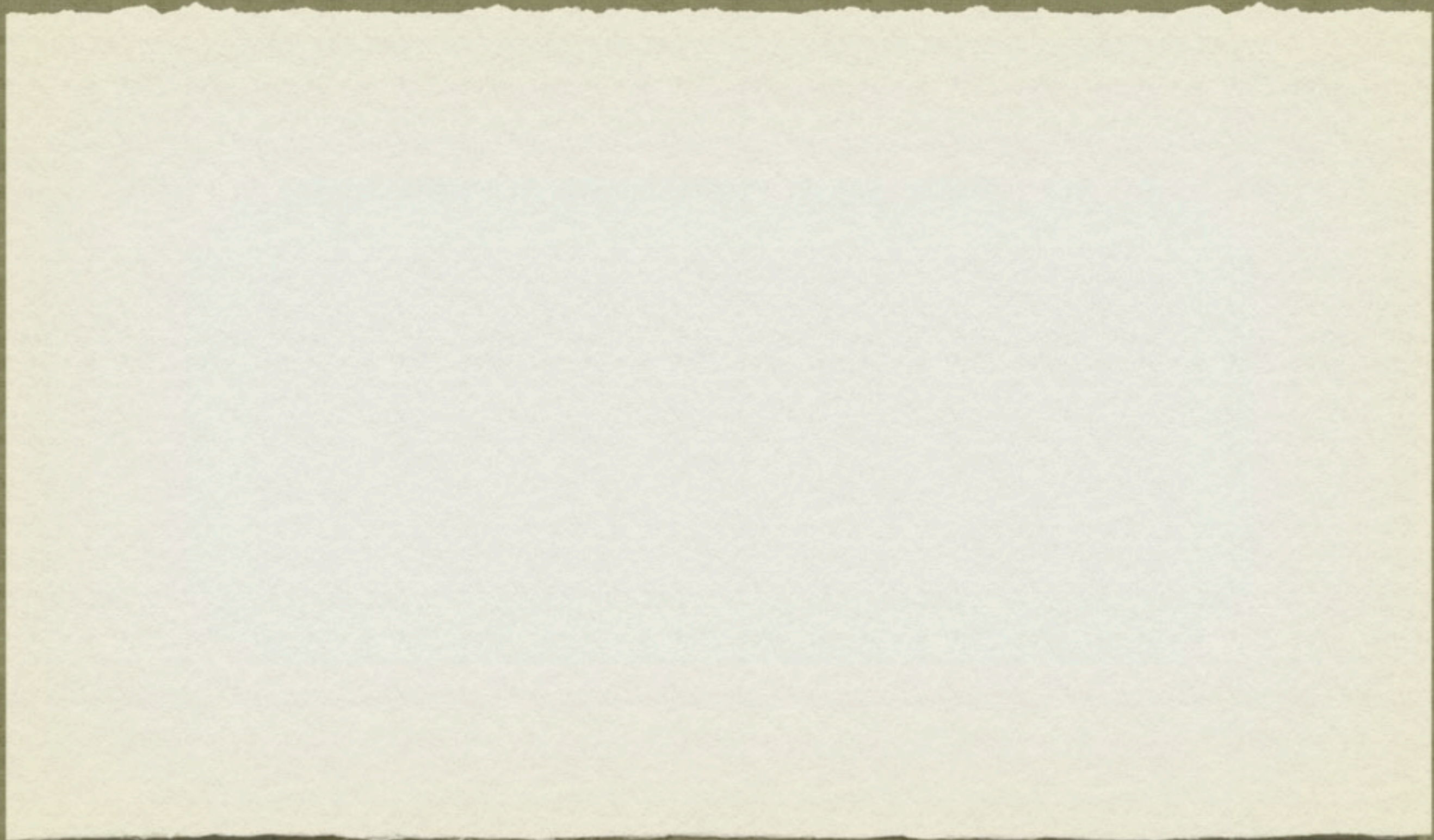
- 1st: You may want to study some field/subject that no one works in your department, faculty, research institute, etc;
- 2nd: You can get in touch with different points of view/interpretations of the same research field;
- 3rd: One can practise/learn English and another foreign language;
- 4th: The opportunity to live abroad and the cultural exchange;
- 5th: ...



DBI INFLATION

Loop Corrections to the Power Spectrum

DBI INFLATION



DBI INFLATION

- Dirac-Born-Infeld Inflation;

DBI INFLATION

- Dirac-Born-Infeld Inflation;
- It's a string inspired model of inflation (a period of accelerated expansion in the early universe);

DBI INFLATION

- Dirac-Born-Infeld Inflation;
- It's a string inspired model of inflation (a period of accelerated expansion in the early universe);
- The kinetic dynamics of the inflation fields are non-trivial;

Some Equations

$$\text{Action } S = \frac{1}{2} \int d^4x \sqrt{-g} \left[R + 2\tilde{P}(\tilde{X}, \phi^I) \right]$$

$$\tilde{P}(\tilde{X}, \phi^I) = -\frac{1}{f(\phi^I)} \left(\sqrt{1 - 2f(\phi^I)\tilde{X}} - 1 \right) - V(\phi^I)$$

$$\tilde{X} = G_{IJ} X^{IJ} - 2f X_I^{[I} X_J^{J]} + 4f^2 X_I^{[I} X_J^J X_K^{K]} - 8f^3 X_I^{[I} X_J^J X_K^K X_L^{L]}$$

$$X^{IJ} \equiv -\frac{1}{2} g^{\mu\nu} \partial_\mu \phi^I \partial_\nu \phi^J$$

Expand the fields into a background and a perturbation part

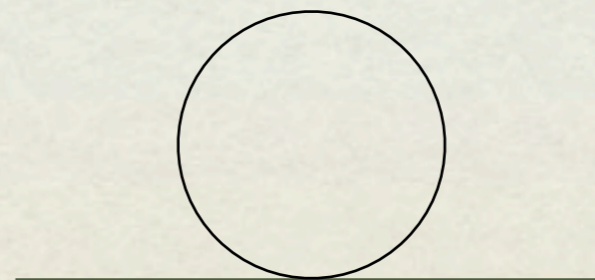
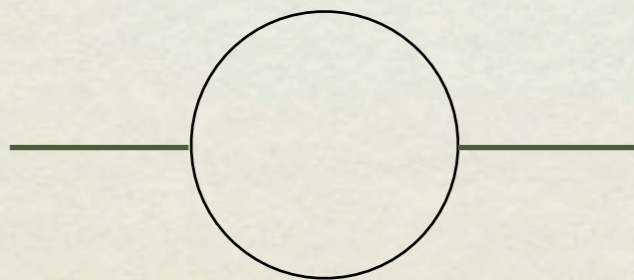
$$\phi^I(x, t) = \phi_0^I(t) + Q^I(x, t)$$

Interaction Hamiltonian $\mathcal{H}_{(3)}^{int}, \mathcal{H}_{(4)}^{int}$

Mizuno, Arroja, Koyama, Tanaka: arXiv:0905.4557v2

LOOPS

- The Power Spectrum of curvature perturbation is related with the 2-point function of the fields;
- The calculation of the 2-point function involves self interactions;





THANKS!



THANKS!

And there is also the cultural experience



THANKS!

And there is also the cultural experience