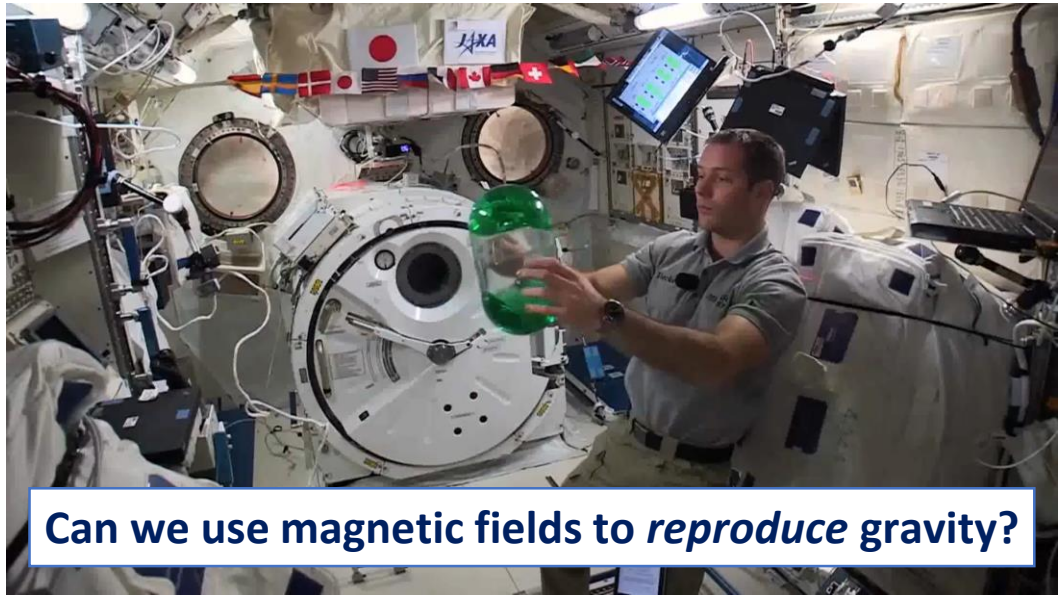
StELIUM (Sloshing of magnEticLIqUids in Microgravity)

UNOOSA DropTES Programme 2019, 6th Cycle

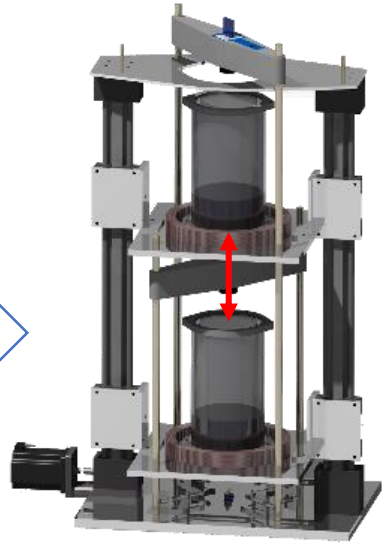
Álvaro Romero-Calvo, Antonio J. García-Salcedo, Francesco Garrone, Inés Rivoalen, Filippo Maggi

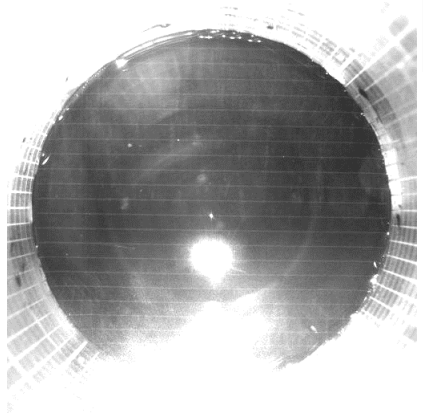
Supported by:

1. Motivation



Can we use magnetic fields to *reproduce* gravity?





2017

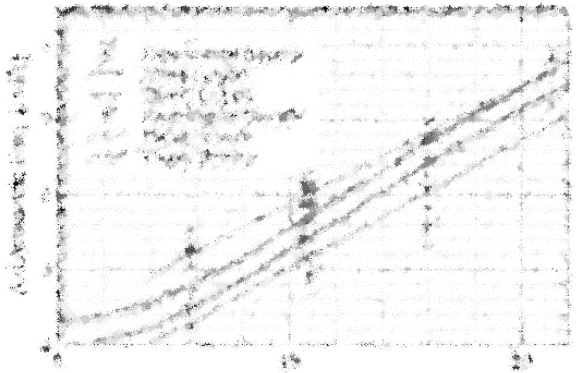
drop your thesis!

The Ferros

UNOOSA

StELIUM

2019



Romero-Calvo et al., Axisymmetic ferrofluid oscillations in a cylindrical tank in microgravity, Microgravity Science & Technology, *under review*

Discrepancy in frequency-current slope

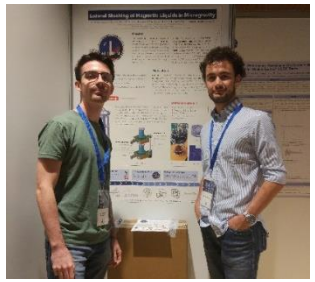
Why is this happening?

Need for further experiments

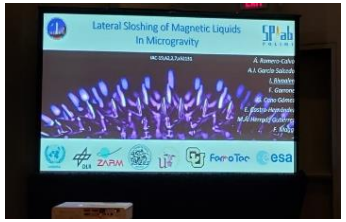
2. An international effort

Great public outreach!

26th ELGRA Symposium and General Assembly - Spain



70th IAC, UNOOSA Workshop, Washington DC



3. ZARM's drop tower campaign

POLITECNICO MILANO 1863

UNIVERSIDAD DE SEVILLA

UNOOSA

UNOOSA DROPTES PROGRAMME

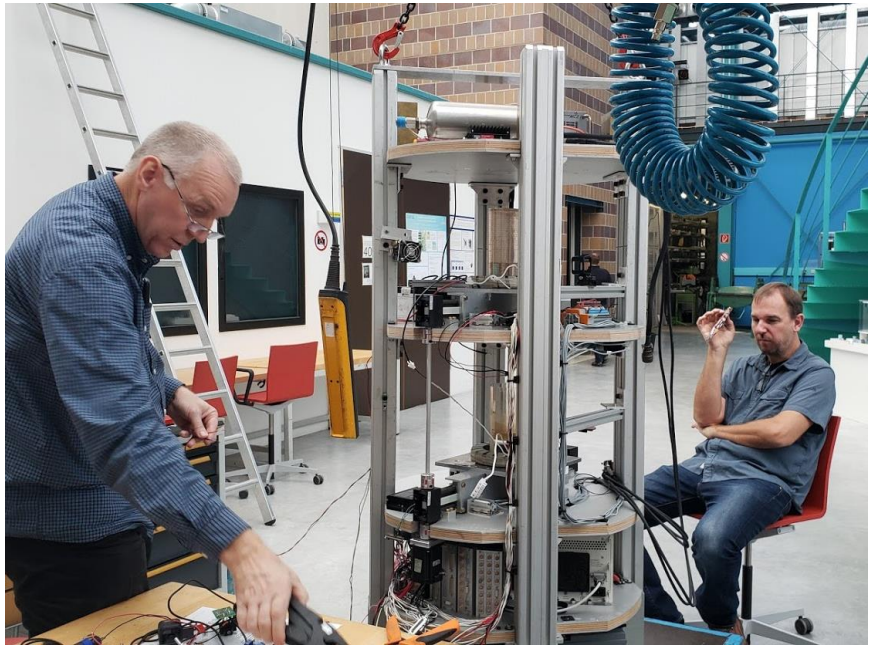
StELIUM

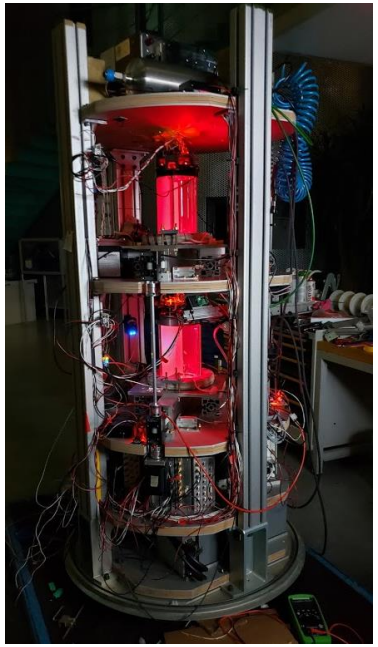
UNIVERSITY OF SEVILLE - POLITECNICO DI MILANO - UNIVERSITY OF COLORADO

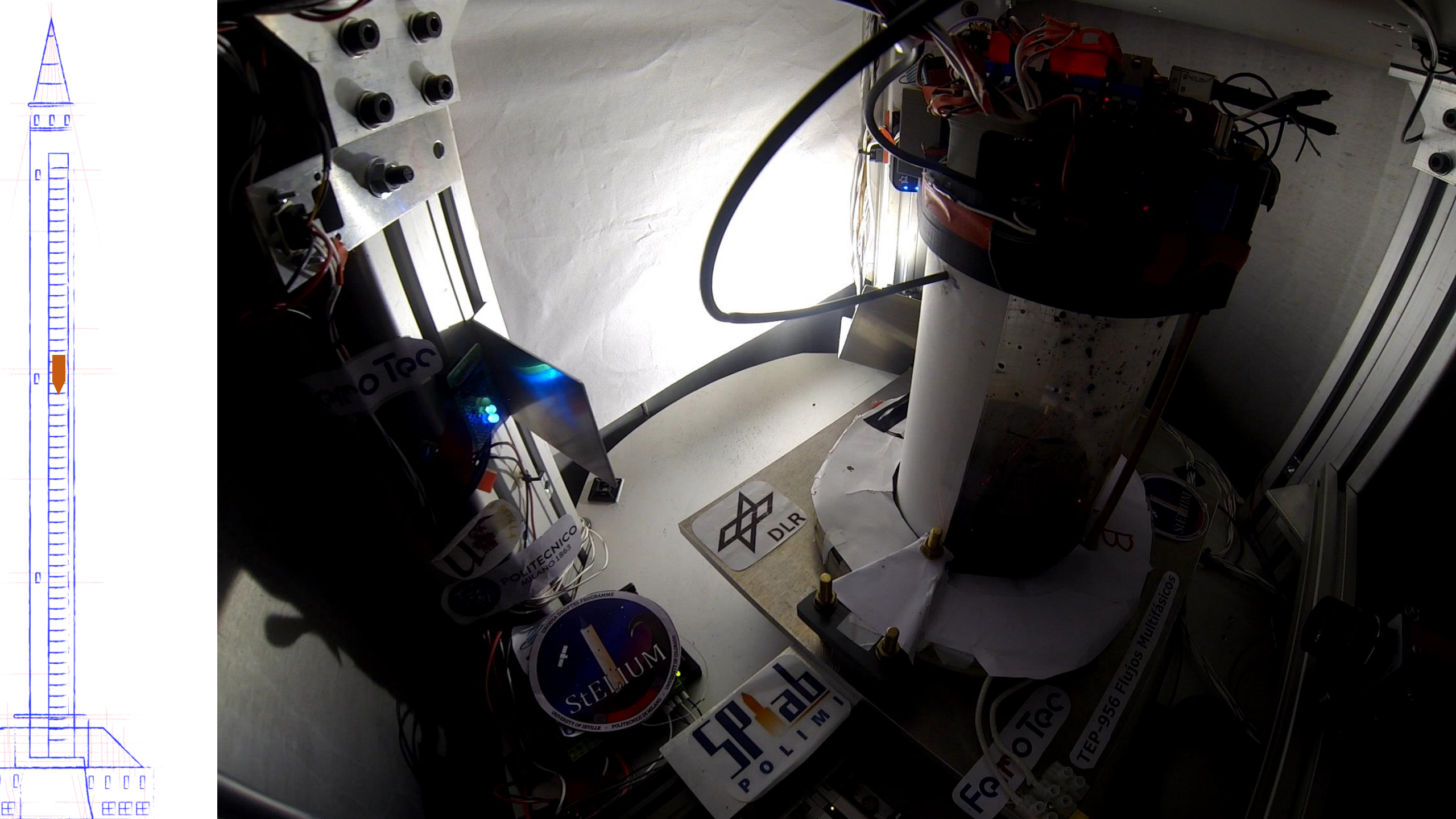
FerroTec

ZARM

DLR






DLR
POLITECNICO
MILANO 1863
StELIUM
SPlab
POLIMI
TEP-956 Flujos Multifásicos

4. The future of UNOOSA DropTES 2019 - StELIUM

ESA DYT 2017 → UNOOSA DropTES 2019 → Preliminary Results (IAC 2019) → Final Results (COSPAR 2021) → New experiments!

ELSEVIER

Acta Astronautica
Volume 173, August 2020, Pages 344-355

StELIUM: A student experiment to investigate the sloshing of magnetic liquids in microgravity

Á. Romero-Calvo [a, b], A.J. García-Salcedo [b], F. Garrone [b], I. Rivoalen [b], G. Cano-Gómez [c], E. Castro-Hernández [d], M.Á. Herrada Gutiérrez [d], F. Maggi [b]

RESEARCH PAPERS

Free and Forced Oscillations of Magnetic Liquids Under Low-Gravity Conditions

Álvaro Romero-Calvo, Gabriel Cano Gómez, Elena Castro-Hernández, Filippo Maggi

Check for updates

+ Author and Article Information

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Published Online: December 19, 2019 Article history

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70th International Astronautical Congress, Washington D.C., United States, 21-25 October 2019.

IAC-19,A2,2,7,x52131

LATERAL SLOSHING OF MAGNETIC LIQUIDS IN MICROGRAVITY

Á. Romero-Calvo[1,*] A. J. García-Salcedo[1], I. Rivoalen[1], F. Garrone[1], G. Cano Gómez[2], E. Castro-Hernández[3], M. Á. Herrada Gutiérrez [3], F. Maggi[1],

Free surface reconstruction of opaque liquids in microgravity. Part 1: design and on-ground testing

Á. Romero-Calvo[a,b,*], A. J. García-Salcedo[b], F. Garrone[b], I. Rivoalen[b], G. Cano-Gómez[c], E. Castro-Hernández[d] and F. Maggi[b]

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ARTICLE INFO ABSTRACT

Free surface reconstruction of opaque liquids in microgravity. Part 2: results of drop tower campaign

Á. Romero-Calvo[a,b,*], F. Garrone[b], A. J. García-Salcedo[b], I. Rivoalen[b], G. Cano-Gómez[c], E. Castro-Hernández[d] and F. Maggi[b]

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ARTICLE INFO ABSTRACT

Materials Sciences in Space (G)
Drop Tower Days (G0.2)
Consider for oral presentation.

Final results!!
COSPAR 2021

AXISYMMETRIC AND LATERAL FREE SURFACE OSCILLATIONS OF FERROFLUIDS IN MICROGRAVITY

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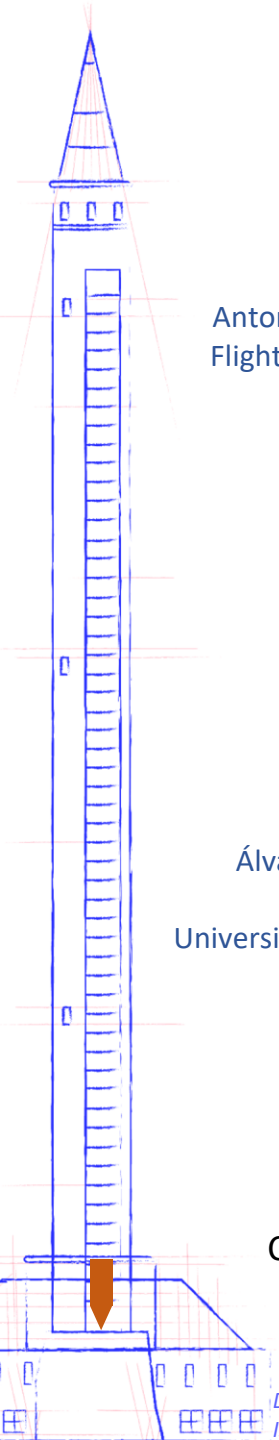
Questions?



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Drop tower image credit: Isabel Romero Calvo