

# LOOKING FOR NEW INTERACTIONS WITH DARK MATTER

# Theoretical framework

- Creating attitudes towards S&T
  - Develop the ability to take informed decisions related to S&T
- 
- (Citizenship and life in democracy)

## "Nature of the interactions"

- Ludic (game as a motivation)
- Diverse (child, teens and adults)
- Co-productive (create a common language)

## "Detectors"

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- person to person feedback (~ to real evaluation process)
- Studies on public perception (SPP)

# This presentation will show....

interactions characterized

- CARD GAMES**
- ICE CREAM**
- OBJECTS**

interactions still not fully characterized

- STUDIES ON PUBLIC PERCEPTION**
- EDUCATIONAL MATERIAL**

**Most of this is done in the context of international dark matter day (Oct 31)**



# FIRST ATTEMPT: PRODUCTION

## "Dark Matter, the card game"



The game simulates a competition for underground laboratories, experiments, and resources, such as data, students, and papers. The game concludes with either no winners, one or multiple winners in the search for Dark Matter.

- Places "Shoes of scientist"
- DM research as a process with social interactions

Take home messages (what we learned)

- Low diffusion
- Limited impact
- person to person feedback

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# FIRST ATTEMPT: CO-PRODUCTION

## "Dark Matter – Science Expansion for Arkham Horror (FM)"

To celebrate Dark Matter Day, we co-create a new 20 card science-themed expansion to the fan-made Dark Matter Arkham campaign.

- DM as an horror framework sets the tone
- Amazing quality of results (graphics, media)
- First motivation of people is not science

Take home messages

- Specific target (fans of AH) already exist**
- Virtual meetings, DISCORD

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# SECOND ATTEMPT: CO-PRODUCTION

## "Marvel: fan-made scenario and villain for DMD2023"



To celebrate Dark Matter Day 2023, we are co-creating a fan-made scenario where the villain "graviton" is the natural connection...

- Amazing quality of preliminary results (graphics, media)
- First motivation of people is not science

Take home messages

- Specific target (fans of MARVEL) already exist
- Virtual meetings, DICORD

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# CO-PRODUCTION: ICE CREAM

## "Dark Matter Ice-cream for DMD 2021,2022..."



The ice cream possesses a secret formula. We discussed dark matter with casual participants, and they have to judge whether the ice cream captures the essence of dark matter or not.

- Black Ice-cream constitutes a research project in its own. (not easy)
- Principal motivation of shop is not science!
- Kids, teens, adults....

Take home messages

- You don't manage time and resources
- Evaluation is person to person
- We tried but failed with more massive stores and larger producers.

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# CO-PRODUCTION: OBJECTS

Prototype phase

## "hand-made local producers in Bariloche"

Weekly meets starting around **our scientific areas**. They then **selected topics of their interest**, that could potentially be marketed to different people, such as tourists, citizens, and scientific staff.

-Things we dont know how to do (commerce, laws, regulations, profit, publicity)... they do!

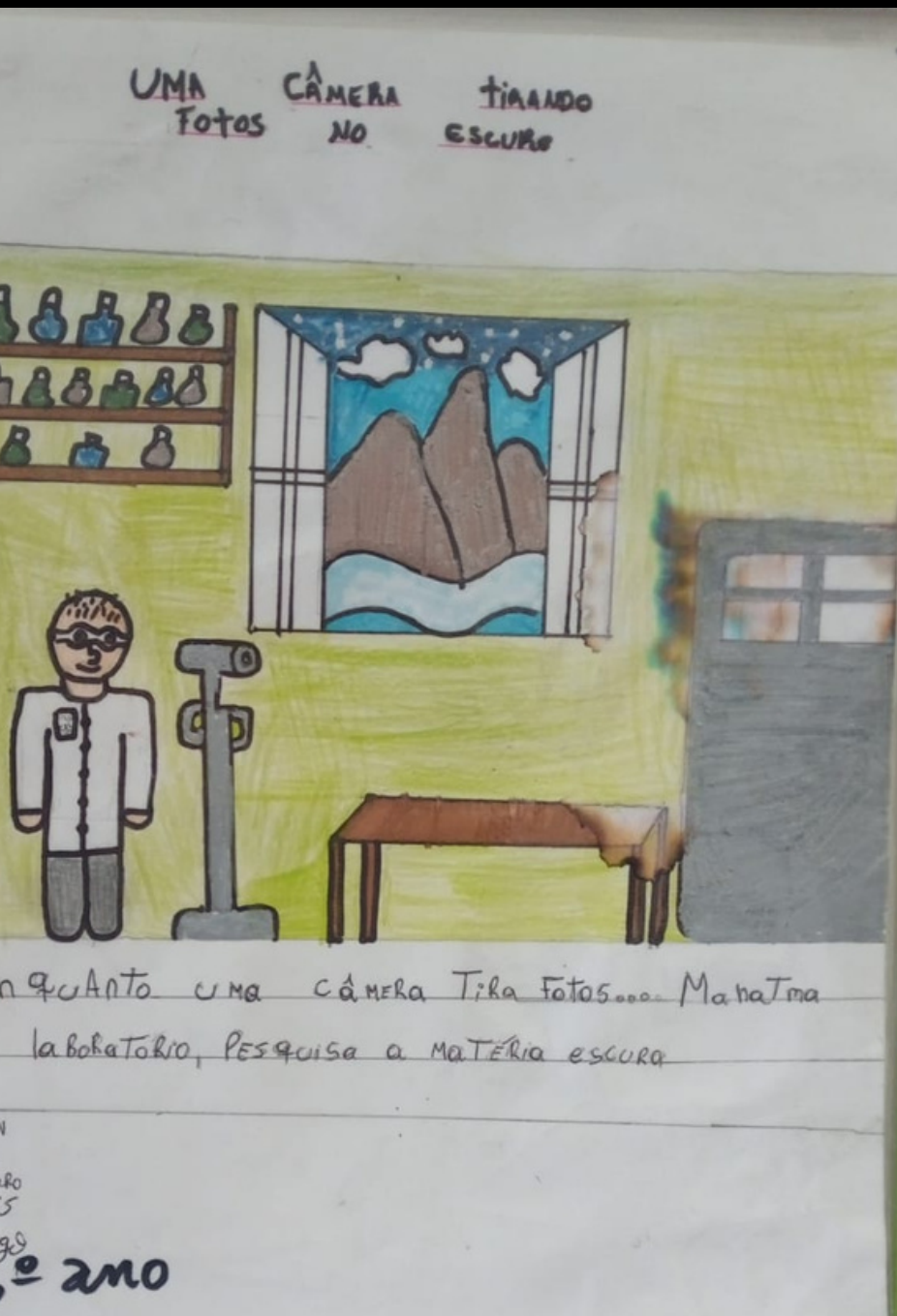
Take home messages

- "common language", you don't manage time, limits of expertise, don't try massive producers
- licence agreement with institucion (bureaucracy)
- "PRE SALE" within sceintific community ensures minimum sales



# EXPLORING INTERACTIONS WITH ELEMENTARIES SCHOOLS

## "Celebration of DMDay 2022"



To celebrate Dark Matter Day 2022, we had virtual meetings with Argentinian and Brazilian schools. Teachers had special classes on DM. We ask for "art" related to what they learn about DM and Und lab

### Preliminary results

- Emerging patterns (such as chemistry laboratory elements) linked to other studies (slide 11)

Take home messages

- We see in the drawings what teachers told them about DM and what they learned
- Motivated us to develop our own material

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# CO-PRODUCTION: COMIC

"I need to know: the hidden matter"

Preliminary results

The artist became member of our laboratory for 15 days, where we engaged in extensive discussions about design, dark matter physics, and the assortment of exceptional and "not-so-exceptional" ideas surrounding of comic's creation.

- Amazing quality of results (graphics, media)
- Principal motivation of artist is not science!
- Material exposed at Tecnópolis, major argentine science fair

Take home messages

- Takes time to create a "common language"
- Acknowledge your own limits of expertise

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Artist Camila Sangiorgi IG: @K.A.M.C1



# EXPLORING INTERACTIONS WITH SECONDARY SCHOOLS

## "Und lab? Dark Matter? Neutrino?" A case study

*Preliminary results*

Survey about the possibility of an Und Lab searching for DM and neutrino physics (ANDES)

- ¿Do you know if there are Und Labs? "NO"
- ¿Why do scientist build Und Labs?



¿Did you hear about Dark Matter? 'YES' ¿Did you hear about neutrino? 'NO'

- Some curious answers I received related to science communication of Und Lab:  
"there is no need to inform" "only tell us important results"  
"be careful about saying too much. It can be as dangerous as gossip"

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# Our conclusions and perspectives

**-Co-production:** people are eager to showcase and share their expertise, even if these areas are not scientific by nature. This allowed us to work with new partners interested in interacting with Dark Matter science or science communication while their primary interest is neither of those:

SHOP OWNERS, FAN OF GAMES, LOCAL ENTREPRENEURS...

**-Studies on Public Perception:** results expected at the end of 2023...

**-Evaluation:** still a weak link in our productions, mostly person to person

**MORE COMING SOON...**

**THANK YOU  
VERY MUCH**

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