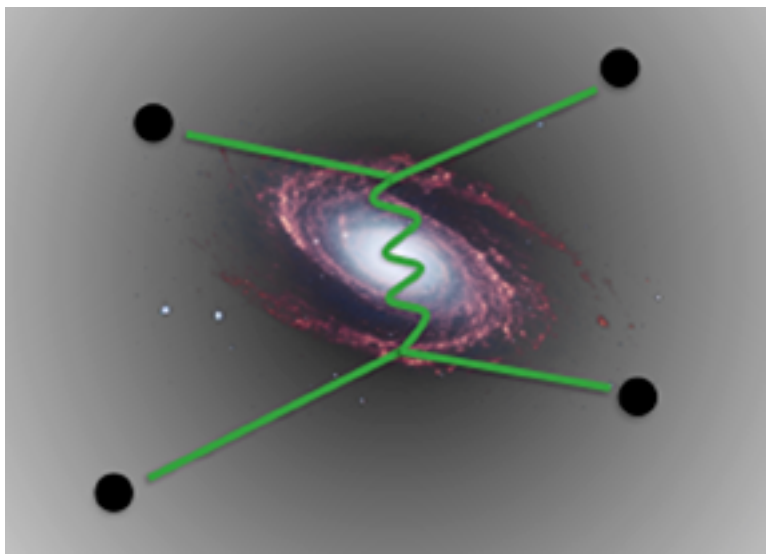


# Valencia Workshop on the Small-Scale Structure of the Universe and Self-Interacting Dark Matter

Monday 09 June 2025 - Friday 20 June 2025



## Book of Abstracts



# Contents

An SIDM simulation of the merging cluster: El Gordo and its tension between the post collision DM density profiles and weak lensing constraints . . . . .	1
Conclusions of the week . . . . .	1
Conclusions of the workshop . . . . .	1
Core Dynamics: a proving ground for dark matter self-interactions . . . . .	1
IFIC Colloquium . . . . .	1
IFIC Colloquium . . . . .	1
Interpretable Machine Learning for Constraining Self-Interacting Dark Matter in Galaxy Clusters . . . . .	1
Moderated discussion . . . . .	2
Moderated discussion . . . . .	2
Moderated discussion . . . . .	2
Moderated discussion . . . . .	2
Moderated discussion . . . . .	2
Moderated discussion . . . . .	2
Moderated discussion . . . . .	2
Moderated discussion . . . . .	2
Moderated discussion . . . . .	2
Moderated discussion . . . . .	2
Moderated discussion . . . . .	2
Moderated discussion . . . . .	2
Moderated discussion . . . . .	3
Moderated discussion . . . . .	3
Moderated discussion . . . . .	3
Moderated discussion . . . . .	3
Moderated discussion . . . . .	3
Moderated discussion . . . . .	3





tbd . . . . .	12
tbd . . . . .	12
tbd . . . . .	12
tbd . . . . .	12
tbd . . . . .	12
tbd . . . . .	12
tbd . . . . .	12
tbd . . . . .	13
tbd . . . . .	13
tbd . . . . .	13
tbd . . . . .	13
tbd . . . . .	13
tbd . . . . .	13
tbd . . . . .	14
tbd . . . . .	14
tbd . . . . .	14
tbd . . . . .	14
tbd . . . . .	14
tbd . . . . .	14
tbd . . . . .	14
tbd . . . . .	15
tbd . . . . .	15
tbd . . . . .	15
tbd . . . . .	15
tbd . . . . .	15
tbd . . . . .	15
tbd . . . . .	15
tbd . . . . .	16
tbd . . . . .	16
tbd . . . . .	16

tbd . . . . .	16
tbd . . . . .	16
tbd . . . . .	16
tbd . . . . .	16
tbd . . . . .	17
tbd . . . . .	17
tbd . . . . .	17
tbd . . . . .	17
tbd . . . . .	17
tbd . . . . .	17
tbd . . . . .	17
tbd . . . . .	17
tbd . . . . .	17
tbd . . . . .	17
tbd . . . . .	18
tbd . . . . .	18
tbd . . . . .	18
tbd . . . . .	18
tbd . . . . .	18
tbd . . . . .	18
tbd . . . . .	18
tbd . . . . .	18
tbd . . . . .	19
tbd . . . . .	19
tbd . . . . .	19
tbd (dark sectors) . . . . .	19





**Simulations / 63**

**An SIDM simulation of the merging cluster: El Gordo and its tension between the post collision DM density profiles and weak lensing constraints**

Corresponding Author(s): valda@sissa.it

60

**Conclusions of the week**

126

**Conclusions of the workshop**

**Simulations / 62**

**Core Dynamics: a proving ground for dark matter self-interactions**

Corresponding Author(s): frank.vandenbosch@yale.edu

139

**IFIC Colloquium**

Corresponding Author(s): jfn@uvic.ca

**Models of dark matter / 138**

**IFIC Colloquium**

Corresponding Author(s): jfn@uvic.ca

**Lensing / 21**

**Interpretable Machine Learning for Constraining Self-Interacting Dark Matter in Galaxy Clusters**

Corresponding Author(s): ethan.tregidga@epfl.ch

**Models of dark matter / 110**

**Moderated discussion**

**Lensing / 102**

**Moderated discussion**

**Models of dark matter / 96**

**Moderated discussion**

**Lensing / 137**

**Moderated discussion**

**Lensing / 44**

**Moderated discussion**

**Simulations / 116**

**Moderated discussion**

**Simulations / 87**

**Moderated discussion**

**Simulations / 29**

**Moderated discussion**

**Simulations / 68**

## **Moderated discussion**

Simulations / 58

## **Moderated discussion**

Models of dark matter / 16

## **Moderated discussion**

Satellites/streams / 52

## **Moderated discussion**

Satellites/streams / 125

## **Moderated discussion**

Lensing / 81

## **Moderated discussion**

Satellites/streams / 73

## **Moderated discussion**

59

## **Moderated discussion**

Models of dark matter / 38

## **Moderated discussion**

**Simulations / 12**

## **Moderated discussion**

**Models of dark matter / 103**

## **Review talk**

**Corresponding Author(s):** shtangas@gmail.com

**Satellites/streams / 127**

## **Review talk**

**Corresponding Author(s):** gbattaglia@iac.es

**Simulations / 1**

## **Review talk**

**Corresponding Author(s):** mfischer@usm.lmu.de

**Lensing / 74**

## **Review talk**

**Corresponding Author(s):** svegetti@mpa-garching.mpg.de

**Satellites/streams / 69**

## **Review talk**

**Corresponding Author(s):** enadler@ucsd.edu

**Simulations / 61**

## **Review talk**

**Corresponding Author(s):** awetzal@ucdavis.edu

**Lensing / 17**

## **Review talk**

**Corresponding Author(s):** anierenberg@ucmerced.edu

**Models of dark matter / 15**

## **Review talk -tbc**

**Corresponding Author(s):** hramani@udel.edu

**Satellites/streams / 45**

## **Review talk: Particle nature of dark matter with stellar streams**

**Corresponding Author(s):** abonaca@carnegiescience.edu

**Models of dark matter / 31**

## **Self-interacting dark matter and inelasticity**

**Corresponding Author(s):** kalliopi.petraki@phys.ens.fr

**Satellites/streams / 50**

## **Short talk**

**Corresponding Author(s):** jmarroyo@iac.es

**Satellites/streams / 124**

## **Short talk**

**Satellites/streams / 122**

## **Short talk**

**Corresponding Author(s):** skarmakar@unm.edu

**Models of dark matter / 107**

## **Short talk**

**Corresponding Author(s):** javier.silvam@pucp.edu.pe

**Models of dark matter / 36**

## **Short talk**

**Corresponding Author(s):** luca.marsili@ific.uv.es

**Models of dark matter / 108**

## **Short talk**

**Corresponding Author(s):** almuo@ific.uv.es

**Models of dark matter / 51**

## **Short talk**

**Corresponding Author(s):** giovani.garcia@student.kit.edu

**Models of dark matter / 95**

## **Short talk**

**Corresponding Author(s):** esau.cervantes@ncbj.gov.pl

**Models of dark matter / 94**

## **Short talk**

**Corresponding Author(s):** fbenetti@sissa.it

**Simulations / 67**

## **Short talk**

**Lensing / 80**

## **Short talk**

**Lensing / 66**

## **Short talk**

**Corresponding Author(s):** isaque.dutra@yale.edu

**Satellites/streams / 123**

## **Short talk**

**Corresponding Author(s):** dkong012@ucr.edu

**Lensing / 78**

## **Short talk**

**Corresponding Author(s):** felix.vecchi@epfl.ch

**Simulations / 65**

## **Short talk**

**Corresponding Author(s):** thomas.j.tomlinson@durham.ac.uk

**Satellites/streams / 49**

## **Short talk**

**Corresponding Author(s):** a.banareshernandez@gmail.com

**Models of dark matter / 37**

## **Short talk**

**Corresponding Author(s):** lorenzo.de-ros@tum.de

**Models of dark matter / 35**

## **Short talk**

**Corresponding Author(s):** drona.vatsyayan@ific.uv.es

**Simulations / 84**

## **The AIDA simulations: galaxy formation in SIDM and WDM**

**Corresponding Author(s):** giulia.despali@unibo.it

**Simulations / 3**

## **The rich astrophysical phenomenology of a dissipative dark sector**

**Corresponding Author(s):** xuejian@mit.edu

**Satellites/streams / 120**

## **The stellar distribution in ultra-faint dwarf galaxies suggests deviations from the collision-less cold dark matter paradigm**

**Corresponding Author(s):** jos@iac.es

**Models of dark matter / 133**

## **Two coincidences are a clue: Probing a GeV-scale dark sector**

**Corresponding Author(s):** yichungphys@gmail.com

**Simulations / 136**

## **Welcome**

**Simulations / 10**

## **short talk**

**Corresponding Author(s):** hyunsukong@utexas.edu



**Satellites/streams / 9**

**short talk**

**Corresponding Author(s):** zhang-xy19@mails.tsinghua.edu.cn

**Lensing / 23**

**short talk**

**Corresponding Author(s):** lishubo19@mails.ucas.ac.cn

**Lensing / 22**

**short talk**

**Corresponding Author(s):** vverma@gradcenter.cuny.edu

**Satellites/streams / 72**

**tbd**

**Corresponding Author(s):** gthomas@iac.es

**Satellites/streams / 121**

**tbd**

**Corresponding Author(s):** isak.stomberg@ific.uv.es

**Simulations / 115**

**tbd**

**Corresponding Author(s):** subha@tifr.res.in

**Satellites/streams / 92**

**tbd**

**Corresponding Author(s):** dblas@ifae.es

**Lensing / 101**

**tbd**

**Simulations / 85**

**tbd**

**Corresponding Author(s):** sownak.bose@durham.ac.uk

**Satellites/streams / 113**

**tbd**

**Corresponding Author(s):** sc0236@uah.edu

**Simulations / 135**

**tbd**

**Corresponding Author(s):** robynes@sas.upenn.edu

**Simulations / 82**

**tbd**

**Corresponding Author(s):** peter.33@osu.edu

**Models of dark matter / 91**

**tbd**

**Corresponding Author(s):** giacomo.landini@ific.uv.es

**Models of dark matter / 90**

**tbd**

**Corresponding Author(s):** oalberto.zapata@udea.edu.co

**Models of dark matter / 89**

**tbd**

**Corresponding Author(s):** ayuki.kamada@gmail.com

**Models of dark matter / 88**

**tbd**

**Corresponding Author(s):** jcamalich@iac.es

**Models of dark matter / 106**

**tbd**

**Corresponding Author(s):** garani@iitm.ac.in

**Models of dark matter / 105**

**tbd**

**Corresponding Author(s):** ibarra@tum.de

**Models of dark matter / 104**

**tbd**

**Corresponding Author(s):** fycr@unm.edu

**Simulations / 100**

**tbd**

**Corresponding Author(s):** rkeeley@ucmerced.edu

**Simulations / 27**

**tbd**

**Corresponding Author(s):** francesca.fragkoudi@durham.ac.uk

**Simulations / 57**

**tbd**

**Simulations / 99**

**tbd**

**Corresponding Author(s):** arobertson@carnegiescience.edu

**Simulations / 98**

**tbd**

**Corresponding Author(s):** yiming.zhong@cityu.edu.hk

**Simulations / 64**

**tbd**

**Corresponding Author(s):** yangdn@pmo.ac.cn

**Simulations / 111**

**tbd**

**Corresponding Author(s):** jfn@uvic.ca

**Simulations / 55**

**tbd**

**Corresponding Author(s):** arka@iiserpune.ac.in

**Simulations / 83**

**tbd**

**Corresponding Author(s):** diemer@umd.edu

**Models of dark matter / 5**

**tbd**

**Corresponding Author(s):** chuxiaoyong@ucas.ac.cn

**Models of dark matter / 13**

**tbd**

**Corresponding Author(s):** kboddy@physics.utexas.edu

**Models of dark matter / 14**

**tbd**

**Corresponding Author(s):** kuldeep.deka@nyu.edu

**Satellites/streams / 128**

**tbd**

**Corresponding Author(s):** sebastian.trujillo@h-its.org

**Satellites/streams / 129**

**tbd**

**Corresponding Author(s):** ngaravito@flatironinstitute.org

**Satellites/streams / 130**

**tbd**

**Corresponding Author(s):** sioree.ansar@durham.ac.uk

**Satellites/streams / 56**

**tbd**

**Corresponding Author(s):** njk3r@virginia.edu

**Satellites/streams / 53**

**tbd**

**Corresponding Author(s):** isabel.santos@durham.ac.uk

**Models of dark matter / 30**

**tbd**

**Corresponding Author(s):** vera.gluscevic@gmail.com

**Lensing / 39**

**tbd**

**Corresponding Author(s):** priyamvada.natarajan@yale.edu

**Lensing / 40**

**tbd**

**Corresponding Author(s):** dmpowell@mpa-garching.mpg.de

**Lensing / 41**

**tbd**

**Corresponding Author(s):** qminor@bmcc.cuny.edu

**Lensing / 42**

**tbd**

**Corresponding Author(s):** wolfgang.enzi@port.ac.uk

**Lensing / 43**

**tbd**

**Corresponding Author(s):** omena@ific.uv.es

**Simulations / 24**

**tbd**

**Corresponding Author(s):** azadeh.fattahi@fysik.su.se

**Simulations / 25**

**tbd**

**Corresponding Author(s):** acruz@flatironinstitute.org

**Simulations / 26**

**tbd**

**Corresponding Author(s):** jiaxin.han@sjtu.edu.cn

**Simulations / 48**

**tbd**

**Corresponding Author(s):** fmunshi@gmu.edu

**Simulations / 28**

**tbd**

**Corresponding Author(s):** bsreedhar@us.es

**Simulations / 54**

**tbd**

**Corresponding Author(s):** alejandra.aguirre-santaella@durham.ac.uk

**Simulations / 4**

**tbd**

**Corresponding Author(s):** sloneil@sas.upenn.edu

**Models of dark matter / 134**

**tbd**

**Corresponding Author(s):** wxfeng@mail.tsinghua.edu.cn

**Models of dark matter / 132**

**tbd**

**Corresponding Author(s):** nuria@ific.uv.es

**Models of dark matter / 131**

**tbd**

**Corresponding Author(s):** kahlhoefer@kit.edu

**Satellites/streams / 119**

**tbd**

**Corresponding Author(s):** skim11@carnegiescience.edu

**Satellites/streams / 118**

**tbd**

**Corresponding Author(s):** jorpega@roe.ac.uk

**Satellites/streams / 117**

**tbd**

**Corresponding Author(s):** tariq.yasin@physics.ox.ac.uk

**Simulations / 114**

**tbd**

**Corresponding Author(s):** erozo@arizona.edu



**Simulations / 112**

**tbd**

**Corresponding Author(s):** [fraternali@astro.rug.nl](mailto:fraternali@astro.rug.nl)

**Simulations / 86**

**tbd**

**Corresponding Author(s):** [jgurian@perimeterinstitute.ca](mailto:jgurian@perimeterinstitute.ca)

**Lensing / 79**

**tbd**

**Corresponding Author(s):** [garciaeh@uci.edu](mailto:garciaeh@uci.edu)

**Lensing / 77**

**tbd**

**Corresponding Author(s):** [carlo.giocoli@inaf.it](mailto:carlo.giocoli@inaf.it)

**Lensing / 76**

**tbd**

**Corresponding Author(s):** [susmita@iiserpune.ac.in](mailto:susmita@iiserpune.ac.in)

**Lensing / 75**

**tbd**

**Corresponding Author(s):** [david.harvey@epfl.ch](mailto:david.harvey@epfl.ch)

**Satellites/streams / 71**

**tbd**

**Corresponding Author(s):** [aditya.d.parikh@gmail.com](mailto:aditya.d.parikh@gmail.com)

**Satellites/streams / 70**

**tbd**

**Corresponding Author(s):** ting.li@astro.utoronto.ca

**Satellites/streams / 47**

**tbd**

**Corresponding Author(s):** d.erkal@surrey.ac.uk

**Satellites/streams / 46**

**tbd**

**Corresponding Author(s):** aroraarpit2806@gmail.com

**Models of dark matter / 34**

**tbd**

**Corresponding Author(s):** prolay.chanda@tifr.res.in

**Models of dark matter / 33**

**tbd**

**Corresponding Author(s):** nicolas.bernal@nyu.edu

**Models of dark matter / 32**

**tbd**

**Corresponding Author(s):** thomas.hambye@ulb.be

**Simulations / 2**

**tbd**

**Corresponding Author(s):** lnecib@mit.edu

**Lensing / 20**

**tbd**

**Corresponding Author(s):** maximilian.von-wietersheim-kramsta@durham.ac.uk

**Lensing / 19**

**tbd**

**Corresponding Author(s):** liran827@icloud.com

**Lensing / 18**

**tbd**

**Corresponding Author(s):** gilmanda@uchicago.edu

**Models of dark matter / 97**

**tbd (dark sectors)**

**Corresponding Author(s):** pralegan@sissa.it