HORIZON 2020

Dance of galaxies: testing General Relativity and alternatives using galaxy velocity fields

Fact Sheet

Project Information

GalaxyDance

Grant agreement ID: 748525

Project website

DOI
10.3030/748525

Project closed

EC signature date
28 March 2017

Start date	**End date**
4 September 2017	3 September 2019

Funded under
EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions

Total cost
€ 146 462,40

EU contribution
€ 146 462,40

Coordinated by
CENTRUM FIZYKI TEORETYCZNEJ POLSKIEJ AKADEMII NAUK
Poland

Objective

We propose to use information encoded in peculiar velocity statistics of galaxies in the Local Universe as well as observed redshift space distortions (RSD) of distant galaxies for rendering new and very precise constraints on the validity of General Relativity (GR) and competing theories of modified gravity (MG) on cosmological and intergalactic scales.
The main objectives and deliverables of our proposed research programme are:

-To obtain precise modeling of both GR and MOG signatures in galaxy velocity field;
-To develop self-consistent models of RSD for a wide class of MOG models;
-To study the systematic impact of baryonic physics on velocity and clustering observables;
-To perform a robust comparison of the predicted and observed velocity and RSD signal;
-To compare cosmological parameters estimated using separately both methods;
We plan to conduct our studies on GR and MG by developing methods proposed by us in previous works. For this goal it is necessary to develop a self-consistent RSD theory for MG. We will put emphasis here on the construction of theoretical models for anisotropic 2-point statistics, that will in a precise way model relations between theoretical quantities and observed ones. As a complementary probe and an important consistency test we plan to model and measure from observations 2-point correlation statistics of radial components of galaxy peculiar velocities. Our project, aimed at using galaxy velocities to test GR and MG theories on cosmological scales, will produce significant and crucial research deliverables that are necessary to fully exploit the new possibilities that the rapidly approaching era of big cosmological data will offer.

Fields of science (EuroSciVoc)

natural sciences > physical sciences > **relativistic mechanics**

natural sciences > physical sciences > astronomy > **extragalactic astronomy**

natural sciences > physical sciences > astronomy > astrophysics > **dark matter**

natural sciences > physical sciences > astronomy > **physical cosmology**

natural sciences > mathematics > applied mathematics > **mathematical model**

Programme(s)

H2020-EU.1.3. - EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions MAIN PROGRAMME

H2020-EU.1.3.2. - Nurturing excellence by means of cross-border and cross-sector mobility

Topic(s)

MSCA-IF-2016 - Individual Fellowships

Call for proposal

H2020-MSCA-IF-2016

See other projects for this call

Funding Scheme

MSCA-IF-EF-ST - Standard EF

Coordinator

CENTRUM FIZYKI TEORETYCZNEJ POLSKIEJ AKADEMII NAUK

Net EU contribution

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Total cost

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Poland

Region

Makroregion województwo mazowieckie > Warszawski stołeczny > Miasto Warszawa

Activity type

Research Organisations

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Last update: 15 August 2022

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