



Project Proposal

Title

The 3D organization of chromosomes and its link to human diseases

Project Description (*max 500 words*)

Our research team works in Statistical Physics and its applications to Molecular and Systems Biology, combining models of physics, computer simulations, development of new technologies, production and analysis of genomic data. In particular, we are developing methods to understand how DNA mutations (structural variants) alter the 3D organization of the genome and impact the interactions between genes and their regulators, paving the way for new diagnostic techniques and treatment of diseases such as congenital disorders or cancer [Dellino et al., *Nature Gen.* 51, 1011 (2019); Bianco et al., *Nature Gen.* 50, 662 (2018); Barbieri et al., *Nature Str.Mol.Bio.* 24, 515 (2017)]. We are also developing a new technology for genomic-scale mapping of those interactions [Beagrie et al., *Nature* 543, 519 (2017)].

The ideal candidate should have a background in physics or engineering and experience with programming or bioinformatics. She/He will work within collaborations including physicists, engineers, geneticists, molecular biologists, and bioinformaticians across EU and USA. Additional information is available at the group research page or via email upon request.

Supervisor(s), Lab/Group details, other additional info.

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