

Colloquium

Image Credit: micro*scope

SPRING 2013

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Journey to the center of genetics.

The experience of a physicist in Iceland.

day

MAY 15, 2013 WEDNESDAY

location

EE01

time

16:00

ABSTRACT

I am a theoretical condensed matter physicist and I worked for eight years at Decode Genetics in Reykjavik, a global leader in human genetics. I learned genetics from scratch with the mind of a physicist. I did statistical analyses of genetic data collected from the Icelandic and other populations searching for genes involved in complex human diseases. During the talk I will introduce the basic concepts of the modern human genetics, again with the physicist's mind. I will explain the statistical methods used to analyze the genetic data with examples from my work on cardiovascular and cancer diseases. I will introduce the notions of linkage disequilibrium, association, haplotype, admixture, single-nucleotide polymorphism, sequencing, and others. One intriguing result is that sometimes genomic regions without a known biological role are involved in diseases, which cannot be explained by the molecular biology. Human genetics is a complex science and a dynamic combination of basic and applied research. But the beauty is the multi-disciplinarity. Every result includes the efforts of big teams of scientists with different background: biology, medicine, chemistry, physics, mathematics, computer science, and others. My talk is about my own experience, but it is also a propaganda for learning the complex science called physics as an avenue towards the even more complex world of the DNA.

The Physics Colloquia are designed to address a non-specialist, broad audience and introduce topics of contemporary research through lectures by leading experts. We warmly invite all members of the student body, including undergraduates enrolled in any programme.

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