



Program FYSICA 2019

Friday, April 5

Amsterdam Science Park

www.fysica.nl

Title: Careers session – Valorization

Abstract: You're a physics student and you've probably been told many times that you have a great career path ahead of you. You're smart, you're analytical, every company is fighting to have you. But there is just one thing holding you back... You have no idea what you want to do when you've finished your studies. Do you recognize yourself in this problem? Well fortunately, you're not alone. Year after year the FYSICA student parallel session is there to inform physics students about what's out there after a physics degree. This year, we focus our student session on valorisation, in short making academic knowledge suitable and available for economic or societal utilisation, or how physics can be used in professional life. We have multiple great speakers talking about how physics is used in their careers, hoping to make it clearer to you what's possible with a career in physics.

Convener: Tom Konijn (Natuurkunde Studenten Amsterdam)

Speakers (in order of appearance)

Title: Physicist, entrepreneur, or both?

Davide Iannuzzi (VU)

Abstract: Physicists are under pressure. Funding agencies and society at large are pushing us not only to explain what we do in simple terms, but also to make an extra effort to bring our discoveries to the taxpayers via entrepreneurial initiatives that we are often not very comfortable with. In this talk, I will first provide an overview of the obstacles that make this effort particularly painful. Taking inspiration from the Demonstrator Lab in Amsterdam, I will then propose a few measures that academic institutes can implement to comply with this pressing request, stressing, among others, the unexpected positive effects that those measures typically generate in students and staff members.

Title: Improving human health with the force of light

Rosalie Driessen (LUMICKS)

*How does the energy landscape of a particular protein cause the misfolding that leads to Alzheimer's?
What causes a DNA repair process to malfunction, leading to breast cancer?*

These are just two examples of fundamental molecular processes that scientists try to unravel using our Dynamic Single-Molecule analysis instruments. LUMICKS' instruments enable, for the first time, analysis of complex dynamic details related to the behaviour and interaction of single molecules. Dynamic single-molecule analysis is rapidly evolving as a mainstream approach in academic and pharma research for the study of DNA-protein interactions, molecular motor activity, and protein folding. LUMICKS is a 4-year-old spin-off from the biophysics department of the Vrije Universiteit in Amsterdam (VU), and now the leading supplier of Dynamic Single-Molecule analysis instruments. We developed our products on the basis of the correlative optical tweezers - fluorescence measurement and imaging technology that was developed at the VU, making use of the fundamental concept of optical tweezers (holding and manipulating objects with light) for which dr. Arthur Ashkin was awarded the Nobel Prize in Physics 2018.

Title: Physics with a mission

Joost Frenken (ARCNL)

Abstract: Modern society is pervaded by applications of physics research. Thus, our field has societal relevance. However, this relevance is usually not the main motivation for us, physicists. And this relevance manifests itself usually only long after we are ready with our research and often in directions that we did not associate with it originally. In some cases, however, fundamental research in physics is set up with an immediate focus on applications. Such application-oriented research can form the basis for a fruitful and inspiring public-private collaboration. ARCNL, the Advanced Research Center for Nanolithography in Amsterdam, is a special example of such a partnership. The academic partners NWO, UvA and VU collaborate intimately with the company ASML to generate new knowledge that will hopefully be of use for the development of groundbreaking, novel technology for the manufacturing of processor and memory chips. In this presentation, I will provide an overview of the wide spectrum of research subjects that ARCNL is currently working on.

Title: NOMI, turning inventions into innovations

Klara Maturova (TNO, NOMI)

Abstract: We at NOMI see a future where humanity will solve many of future's challenges in data, energy and life sciences by a continuous miniaturization in device fabrication down to an atomic scale. We develop the technologies that enable exploration and exploitation of the atom-scale world level leading to the real-world applications. We turn inventions into innovations (and valorize on the investments) by collaboration with existing commercial partners but also act as an incubator to start new/joint ventures. These ventures make use of the NOMI technology research to create the instruments to image, measure and fabricate devices at the level of individual atoms at a humanly acceptable and economically attractive level.