Juryrapport
Shell Afstudeerprijzen voor Natuurkunde 2022

The jury was impressed by the fifteen nominations for the Young Talent Shell Graduation Awards for Physics 2022. After considerations and exchange by e-mail, in the final meeting on October 3rd, the jury came to the following ranking:

1st Prize: X.M. (Xander) de Wit MSc, Eindhoven University of Technology
The transition towards a large-scale vortex in fluid turbulence - Direct Numerical Simulation of rotating Rayleigh-Bénard convection

Xander performed highly parallelized direct numerical simulations for rotating thermal convection, finding different flow regimes. He then theoretically analyzed the results, which has led to a deep physical understanding of the transitions between the regimes. The thesis is written excellently and very maturely, and has already led to various publications in the prime journals of our field, Journal of Fluid Mechanics, Physical Review Letters, and Physical Review Fluids. It has been a pleasure to read this outstanding thesis.

2nd Prize: S.C. (Sofieke) ten Kate MSc, Twente University
Investigation of selective area grown PbTe nanowires for quantum computing applications

Sofieke performed very careful experiments on nanowires made of lead telluride to test their suitability for future application in quantum computers. She has made a convincing analysis of the single electron quantum physics that occurs in these materials, and described her findings in an excellent manner in her thesis. During her research project Sofieke performed already at the level of a PhD student, according to her supervisors: she worked very independently, needed hardly any feedback, and presented her work in an excellent manner. This same positive impression is reflected in the outstanding thesis, which reads as if it is written by a mature scientist who is in full control of all aspects of this advanced research topic.

3rd Prize: R.M. (Rinske) Alkemade MSc, Utrecht University
Exploring the link between glassy dynamics and structure using machine learning

Rinske did numerical simulations to explore dynamical heterogeneities in glassy mixtures of hard spheres, connecting the dynamics and the structure of the glassy system, by employing and developing a variety of machine learning techniques. The work has led to two papers in the highly respected Journal of Chemical Physics. The thesis shows that she masters both the difficult simulations themselves, the analysing techniques, and that she could develop even a theory. The thesis is extremely well presented and a great pleasure to read.

Prof. dr. D. (Detlef) Lohse, hoogleraar physics of fluids en universiteitshoogleraar Universiteit Twente, member of the Max Planck Society and external member of the Max-Planck Institute for Dynamics and Self Organization in Göttingen
Prof. dr. E.P. (Erik) Verlinde, hoogleraar theoretische natuurkunde Universiteit van Amsterdam

De jury vergaderde op 3 oktober 2022 via Zoom onder leiding van KHMW-directeur Drs. M.M.G. (Marijke) Pubben. Tevens waren ter vergadering aanwezig Prof. dr. A.P. (Ad) IJzerman, secretaris natuurwetenschappen KHMW) en Drs. S. (Saskia) van Manen, secretaris KHMW en E.I. (Edith) van Leerdam, secretariaat.