

# Heineken Young Scientists Award 2020 in Natural Sciences awarded to **Freddy Rabouw**



Freddy Rabouw  
Photo: Millette Raats

The Royal Netherlands Academy of Arts and Sciences has awarded the Heineken Young Scientists Award 2020 in the Natural Sciences to Freddy Rabouw (b. 1988), a physicist/chemist at Utrecht University. Rabouw is receiving the prize for his research on new materials to generate light, for example for solar cells or display screens.

The Heineken Young Scientists Awards are important incentive prizes for young researchers whose outstanding achievements mean that they set an example for other young scientists. Each prize comprises a monetary award of EUR 10,000 and an artwork.

The jury describes Freddy Rabouw as a highly productive researcher who is already an internationally respected authority in his field. He is an inspiration for the master's degree and PhD students in his group and a gifted instructor, who has already received a prize from his students for his teaching.

## **Research on materials for light**

Rabouw investigates new materials to generate light, for example for solar cells or display screens. The materials he studies are mainly nanocrystals of only a few thousand atoms in size. What he is attempting to understand is how such a nanocrystal can efficiently convert one colour of light into another. This is fundamental research, but with various applications. For example, semiconductor nanocrystals, also known as "quantum dots", are used in the latest generation of televisions. The challenge, for example, is to narrow down the colour spectrum of the light that is emitted so that the television can display more highly saturated colours, which then appear clearer and brighter. It is difficult, however, to narrow down the colour spectrum if the various nanocrystals are only very slightly different and therefore all emit a slightly different colour light. Dr Rabouw is attempting to identify such differences in properties between nanocrystals, and thus understand what causes these differences.

His work may also have applications in the search for sustainable energy solutions. A certain type of nanocrystal is based, for example, on rare-earth metals, making possible highly exceptional colour conversions. Some can absorb infrared light and then emit visible light. This is exceptional, because infrared light contains less energy per photon than visible light.

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This property is very useful in the case of solar cells because sunlight contains a large amount of infrared light, which solar cells cannot use to generate electricity. By first using nanocrystals to convert the infrared light into visible light, the solar cell can generate more electricity.

## **About the laureate**

Freddy Rabouw studied chemistry at Utrecht University, receiving his master's degree (on Nanomaterials: Chemistry & Physics) cum laude. He also gained his PhD in Utrecht cum laude for his research on nanomaterials, after which he spent two years at ETH Zurich with the aid of a Rubicon grant from the Dutch Research Council (NWO). He returned to Utrecht University as an assistant professor in 2017.

Rabouw has received a number of awards and grants for his work, for example a VENI grant from NWO in 2017 and in 2019 an NWO "KLEIN" fundamental research grant (ENW-KLEIN).

## **Heineken Young Scientists Awards**

Freddy Rabouw is one of four researchers receiving this year's Heineken Young Scientists Award. The winners are selected from four research domains: Medical/Biomedical Sciences, Humanities, Natural Sciences and Social Sciences. The jury consists of Academy members and members or alumni of The Young Academy. This year, it was chaired by Carl Figdor, an Academy member and professor of immunology at Radboud University Nijmegen. Each prize comprises a monetary award of 10,000 euros (funded by the Alfred Heineken Fondsen Foundation) and an artwork.

The Heineken Young Scientists Awards are among the ten prizes making up the biennial Heineken Prizes for Science and the Arts. The winners of the Heineken Prizes will receive their prize on Thursday 1 October 2020.

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## **Note for editors**

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For visuals relating to the Heineken Young Scientists Awards, click [here](#).

## **About the Heineken Prizes**

Over the past five decades, the Heineken Prizes have become an internationally renowned distinction. They are the Netherlands' most prestigious prizes in the arts and sciences. Every two years, five internationally renowned researchers and one artist, who lives and works in the Netherlands, are honoured. The work of the laureates offers new perspectives, achieves unexpected breakthroughs, and opens up new avenues for others. Since 2010 future generations are also celebrated. Four highly promising young researchers working at Dutch research institutes receive the Heineken Young Scientists Awards.

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The laureates are selected by juries made up of members of the Royal Netherlands Academy of Arts and Sciences, the Young Academy, and international experts. The Heineken science prizes include a monetary reward of USD 200,000. The artist receives EUR 100,000, half of which is intended for a publication and/or exhibition. The incentive prizes for young scientists are EUR 10,000 each.

The Heineken Prizes were instituted in 1964 by Alfred H. Heineken (1923–2002) in honour of his father Dr Henry P. Heineken (1886–1971). In that year the Dr H.P. Heineken Prize for Biochemistry and Biophysics was awarded for the first time. It has since been joined by five other Heineken Prizes: the Dr A.H. Heineken Prize for Art (1988), for Medicine (1989), for Environmental Sciences (1990) and for History (1990), and the C.L. Carvalho-Heineken Prize for Cognitive Science (2006).

Alfred Heineken's daughter, Charlene L. de Carvalho-Heineken (b. 1954), is continuing this tradition as chair of the Alfred Heineken Fondsen Foundation and the Dr A.H. Heineken Foundation for Art, which finance the prizes.

For more information, go to [www.heinekenprizes.org](http://www.heinekenprizes.org) and Instagram [@heinekenprizes](https://www.instagram.com/heinekenprizes).