

PhD theses **in a nutshell**

Tiny invader

The small hive beetle poses a threat to beekeepers. The little creature uses the bee as a host and feeds on honey, honeycomb and pollen. But it pupates outside the hive. Bram Cornelissen studied that pupation and how the beetles spread. The young beetle finds its hosts using smell. The bigger the bee population, the more the beetle is attracted to it. Once in the hive, the beetle stays there. Cornelissen also modelled the effect of global warming on the way the beetle spreads. Conclusion: bad news for beekeepers. The beetles are set to do better and better in our region in future.

To the Skies and Underground **Bram Cornelissen** ◀ Supervisors **Joop van Loon** and **Peter Neumann (Bern)**

Virus divides

Multipartite plant viruses package their genome in separate virus particles, each of which is necessary for an infection. The relative quantity of each virus particle (the genome formula) is variable. This is thought to offer the advantage of making the virus more flexible. Dieke Boezen used different techniques to study the variation in the genome formulae of a number of plant viruses. It turned out that the formula didn't depend on which species of plant hosted the virus, but on the environment where the host plant was growing. Boezen thinks the composition of the soil and the soil bacteria play a role in this. *The ecology of multipartite plant viruses* **Dieke Boezen** ◀ Supervisor **René van der Vlugt**

Drugs in the water

VVia sewers, a lot of medical drugs get into nature, where they disturb aquatic life. Plenty is known about deadly doses of these drugs, but what are the effects of long-term exposure to them in non-lethal quantities? Nandini Vasantha Raman, from India, made the first attempt to chart this for substances such as diclofenac (a painkiller) and fluoxetine (an antidepressant). The effects vary. Sometimes phytoplankton even grows better if there is diclofenac in the water. That is because the substance does more harm to pests like parasitic fungi than to the phytoplankton. And different drugs have different effects, even when they are closely related. Which makes it extremely difficult to develop ecotoxicological tests.

The hidden impact **Nandini Vasantha Raman** ◀ Supervisors **Miquel Lürling** and **Lisette de Senerpont Domis (Twente)**