The Voice

Volume 68
Issue 2 *Winter/Spring*

Article 19

Dr. Channon Visscher

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Dr. Channon Visscher ('00) is interested in the atmospheric chemistry of giant planets like Jupiter and Saturn as well as exoplanets and brown dwarfs.

Exoplanets are planets that orbit stars other than the Sun, and brown dwarfs are objects that are heavier than planets but fall short of being stars. Visscher models the physical and chemical processes in planetary and astrophysical environments to better understand the chemistry behind the observed properties of planetary atmospheres and to gain clues about the formation of planetary systems.

"Brown dwarfs are more massive than planets, but they're not massive enough to sustain nuclear reactions in their core. They're in-between objects that glow a little brighter than planets do—an interesting middle population," he explains.

Along with teaching at Dordt, Visscher holds a joint appointment as a research scientist with the Space Science Institute in Boulder, Colorado, which supports much of his astrophysical research.

Lately, he's been looking into cloud formation in exoplanets. "When we look at the findings from different space-based telescopes, we can see how clouds shape observational properties, like color and brightness," he says. "What I'm looking at is the chemistry of clouds: what clouds are expected to form, and at what temperatures and pressures?"

Interestingly, exoplanet clouds can form from elements like magnesium, silicon, and iron. "We normally associate these with rock and minerals, but because these are such high temperature atmospheres, they can actually form these clouds," says Visscher. "There is now observational evidence that matches what had been largely theoretical chemical models of the clouds. That tells us we're on the right track with understanding what's going on in the chemistry."

Visscher's detailed chemical models of the expected atmospheric chemistry are based on available observational clues. These models are then used to develop so-called forward models, which simulate what the spectra (variations in light over different wavelengths) would look like based on that chemistry. The models can then be compared to spectral data retrieved from astronomical observations to test how good the chemical models are at explaining what we see.

"There's a model data comparison that's at the center of this work," says Visscher. "And that's why it's so collaborative, because you have three main pieces that need to work together so that we can gain a better understanding of what these atmospheres are like."

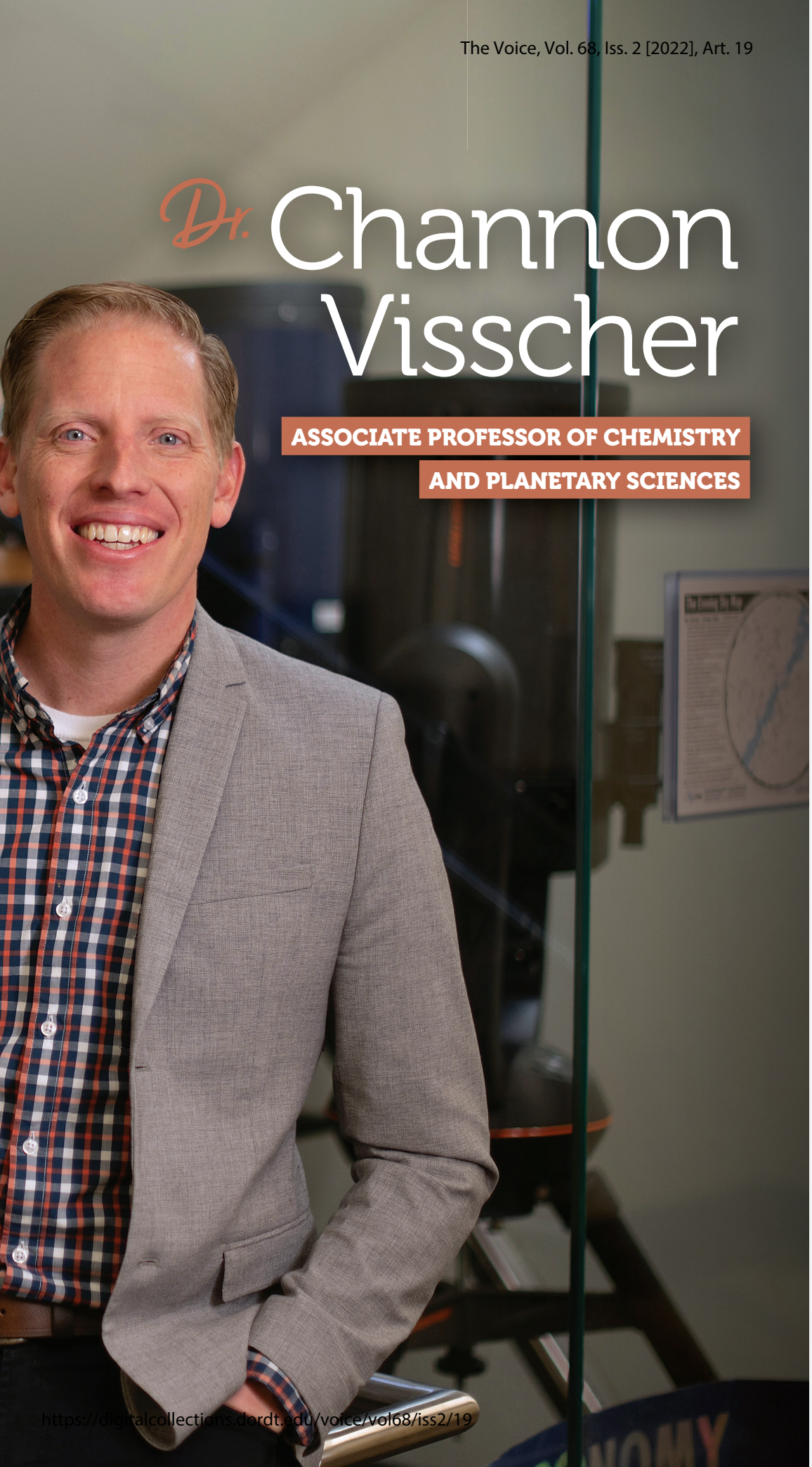
Most of Visscher's research is supported by grants from NASA. That research was recently selected for funding from the James Webb Space Telescope (JWST). The JWST program supports the type of theoretical work that Visscher is doing so that scientists can gain a better understanding of what they are seeing out in space.

Visscher's research endeavors have expanded in the past few years. Last year, he served as a co-author on six peer-reviewed journal publications and wrote an article on the chemistry of planetary atmospheres for the *Oxford Research Encyclopedia of Planetary Science*. He is currently co-editing a book with a Bethel University history and theology professor that engages in a science and religion dialogue from interdisciplinary perspectives. He also has four other research projects currently sitting on his desk, not to mention the email requests he frequently receives from fellow scientists looking to collaborate on possible new projects.

Visscher's research influences his teaching, but his teaching also influences his research.

"Science is active. We're on the edge of discovery and learning new things every day," he says. "With my students, I try to convey that sense of wonder. There's an inherent curiosity we share about the structure and unfolding of creation: why does the universe look this way? How does it work? How did it get this way? I think teaching has helped me see the bigger picture in my research; it's made me more patient, and it's reminded me to be more thoughtful about putting together all these pieces as we learn more about these worlds without end."

JAMIN VER VELDE ('99)



Dr. Channon Visscher

ASSOCIATE PROFESSOR OF CHEMISTRY AND PLANETARY SCIENCES

ALUMNI NOTES

Danielle (Kamps, '99) **Constant** was recently appointed to the Pima County Superior Court in Arizona. She currently is a managing partner of the Jennings Strouss & Salmon Tucson office. In addition to earning a bachelor's degree in history from Dordt, Constant graduated from the University of Arizona College of Law in 2002.

Jason Jonkman ('98) of Erie, Colorado, received the Viterna Award for Engineering Excellence by the Business Network for Offshore Wind. Jonkman, who works for the National Renewable Energy Laboratory, created, developed, maintained, and optimized FAST, one of the world's foremost engineering computer design tools developed to assess coupled dynamic loading on offshore wind turbines.

To celebrate their 50th birthdays, **Amy** (VanderPol, '95) **Van Belle, Deb** (De Jong, '95) **Krikke, Jennifer** (De Stigter, '95) **Van Dam**, **Kim** (De Jong, '95) **Groeneweg**, **Corinna** (Vander Woude, '95) **Louters**, **Annetta** (De Jong, '95) **Hommes**, **Leslie** (Hellinga, '95) **Tel**, and **Kendra** (Griess, '94) **Morgan**, **Carla** (Visser, '93) **Brouwer**, **Tawnia** (VanderVeen, '93) **Hultink**, **Melissa** (Westra, '93) **Bloemhof**, **Carla** (Visser, '93) **Brouwer**, and **Julie** (Hendricks, '93) **Vander Velden** reunited in Pismo Beach, California. "We all met 32 years ago at Dordt, and our friendship has remained strong," writes Morgan. "God had a plan for us, and I am so thankful for it and for each of these women. What a feat to get 12 of us together again for the fourth time!"