WHAT CAN PHYSICISTS DO?

An interview series that profiles scientists who opted for careers outside of academia.

David Gagnon

analyzes baseball to give his team a competitive edge

By Toni Feder

Team lead, baseball sciences, Washington Nationals Baseball Club

BS, mechanical engineering, Brown University, 2010
PhD, mechanical engineering and applied mechanics, University of Pennsylvania, 2017

What was your research focus?

I started off in physics but switched to mechanical engineering to work in a particular fluid dynamics lab. As a graduate student, I studied how biological organisms swim through non-Newtonian fluids. For practical applications, like fertility studies, you want to know how organisms move through biologically relevant fluids like mucus.

(Photo by Amanda Bowen/Washington Nationals.)

How did you end up with the Washington Nationals?

As a postdoc in physics at Georgetown University, I was ready to go on the faculty market. I wanted to keep doing experimental fluid dynamics, but I saw a posting for a full-time analyst role at the Washington Nationals and thought it would be a fun and interesting application of my skill set. The quote "Pitching is not mysterious, it's just physics" [said by Brian Bannister in the 2019 book *The MVP Machine: How Baseball's New Nonconformists Are Using Data to Build Better Players*] was a nudge to look into it. I started with the Nationals in January 2020.

How did you make the transition?

My postdoc and PhD advisers encouraged me to explore, and they made it clear that it didn't have to be a permanent career change.

How do you spend your time?

I work with vast troves of information about how players, the ball, and the bat move and interact. I build models to evaluate our players' pitching, hitting, and defensive skills. I provide tools to help the rest of our organization make decisions about players and their development and how to interpret the game to get competitive advantages.

How do you use physics in your job?

Thinking about throwing a ball that spins and translates through the air, or swinging a bat that has inertia and mass, or the collision dynamics between a ball and a bat, or the kinematics of a fielder moving toward a ball involves physics. Fluid dynamics is helpful. I often apply physics concepts for models and data analysis.

What new skills did you need to pick up?

I had to learn how to write deployable code. I have also developed stronger skills in machine-learning modeling.

What do you like about your job?

I am immersed in a dynamic, collaborative, and competitive environment.

Is there anything you'd like to add?

Every major sports team, not just in baseball, has analysts and scientists. There are plenty of opportunities to get involved. PT

Read more interviews in the series at https://physicstoday.org/wcpd.