



## A commitment to success

Dr. Garrick Villaume (PhD, Physics, 1998; B.S. Physics, 1989)

**You received your PhD in 1998 (Thesis: “Contained Event Classification in Soudan 2 With a Neural Network”) advised by Professor Earl Peterson. What was the best part of working on your research? What was the most difficult part of your working on your research?**

The best part was working with terrific people on a great project, on campus as well as in the Soudan mine, where I spent a lot of time as a research assistant. I was able to collaborate with people from a broad range of backgrounds and cultures, and learned from all of them. The most difficult part was going to grad school as a father of four small children, and trying to finish my thesis while working full-time at Seagate. I took the Seagate job prior to completing my thesis - to better support my family - and it was an extremely trying time for me, my wife, and our children. I'll take a moment to thank Earl and Marvin Marshak for their great support during that difficult time.

**Who were your favorite professors at the University of Minnesota?**

I generally liked all my instructors; I had very few professors I didn't get along with or didn't think I had much to learn from. My favorites are all in physics, of course. Four stand out in particular: Serge Rudaz, Ben Bayman, Earl Peterson, and Clayton Giese. These people taught me how to think and helped make me who I am.

**What were your favorite classes at the University of Minnesota?**

There were few classes I didn't like. Physics courses were always of most interest to me and provided the greatest ultimate enjoyment, though several math and computer science courses were notable, as were some history and literature courses I took.

**What are your favorite memories of your time at the University of Minnesota?**

Due to the fact I received both my BS and PhD from the U, and because of my family situation, I was around campus for quite some time - nearly 12 years of regular presence between 1982 and 1994. I have many wonderful memories of people and events during those years. I couldn't begin to single one out as a “favorite.” I'll say being there as a graduate student and TA/RA, and therefore a real part of the U as student, instructor, and researcher is my fondest memory.

**Do you have any humorous stories to share about your time in the department?**

There were many good times and many opportunities to laugh. The really funny stories would best be told over a beer or two at one of the well-known establishments in Dinkytown or Stadium Village.

**You are an Executive Director, RHO Product Integration, at Seagate Technology LLC. What brought you to Seagate Technology?**

The money! I was trying to support a family while working on my doctorate. At the time I accepted the job offer at Seagate (Feb 1994) I had started working directly on my thesis and was thinking about permanent employment. Funding for HEP was dwindling - the SSC project was cancelled, for example- and the outlook for post-doc positions and tenure-track professorships was grim. My family commitments presented demands that potential academic positions couldn't satisfy. I needed to earn more money, and a friend of mine - also a two-time UM Physics grad (BS, MS) - had just advanced to a manager position after working for a few years at Seagate's recording head operation in Bloomington (acquired from Control Data). We crafted a plan to bring me in, and took it from there. I started as an engineer in one of the wafer fabrication process groups, rather quickly moved to test and device characterization, and started managing shortly after completing my dissertation in February 1998.

**Tell us about your job.**

In my current position, I manage the overall performance, reliability and cost of Seagate's recording heads from the product integration phase through volume manufacturing to end of life. My organization works with design and manufacturing personnel in the head operations to establish optimal design solutions, and specify process and test criteria that assure heads meet functional product requirements at lowest possible costs. In order to do this, we directly collaborate with numerous business units and groups, spanning drive design and manufacturing, quality, materials management, and finance. Specifically, I have a program management unit that coordinates the broad and complex operations used to produce recording heads for the various products in our portfolio, an electrical integration group that defines appropriate tests and specifications to measure and predict head performance in development and manufacturing, and a performance engineering group that applies process and design

knowledge and relationships to maximize product design entitlement in manufacturing, and meet requirements with ever increasing efficiency.

#### **What has been your most interesting project so far?**

I've been fortunate to work on many challenging and interesting projects, as an engineer and as a department leader and representative of my business unit, Recording Head Operations. I've led or have been a principal contributor to several corporate wide projects resulting in substantial re-engineering of critical business processes, ranging from failure analysis to product performance control systems, to yield and financial forecasting. Thus far, the most interesting is the one I've been leading for about two years, with a bit less than a year to go before we fully realize the vision. I am leading a broad effort to evolve Seagate's entire product requirements management process, spanning the complete disc drive system functionally, and across the many representations of requirements, e.g. Marketing- or customer-based to design-specific criteria. This has been incredibly challenging, due to both the scope and scale of the effort as well as the difficulty maintaining focus and coordination across so many different functions for so long. Previous efforts to do this have fallen short, and I can say we will accomplish our goals within the next 10-12 months, significantly increasing the leverage Seagate's vertical integration provides.

#### **How do you use your physics degree in your work?**

I've actually given this a great deal of thought over the years, and the specific answers change a bit as I evolve and progress in my career. Earlier, when I worked as an engineer and first level manager, I routinely employed detailed knowledge of electromagnetism and computing. I designed and developed advanced test characterization systems for thin-film recording heads, and implemented automatic factory metrology systems. As I advanced, I had less opportunity to directly apply my knowledge and skills, but my functional roles have very much benefited from my physics background. What has been of great, persistent value is my knowledge of fundamental physical laws; bedrock mathematical training that was essential to my physics degree; and fundamental computational knowledge and programming experience. At Seagate - a highly complex, so-called vertically integrated company, that develops and manufactures the essential components for its disc drives - I have pioneered an engineering approach that helps reveal the strengths and weaknesses of various designs and/or processes by comprehensive analytical treatment of an enormous amount of metrology and test data acquired over multiple build stages, each with numerous unit processes. While my specific training in elementary particle physics doesn't directly apply to these works, the insight I acquired while studying it - how science works, how mathematics and computation augment physical reasoning and experimentation, and so on - is invaluable. In short, by training in HEP, I learned to think like a scientist, and seem able to apply that learning to arbitrary problems. What continues to intrigue me is how far outside of "core engineering" those principles and techniques can be applied, for example to transactional

business processes used to plan or manage a product line or market strategy.

#### **Where did you grow up? What was the best part of growing up there?**

I grew up in the suburbs south of St. Paul, at the edge of rural Dakota County. I lived on a small hobby farm in Sunfish Lake. We had 30 acres and raised numerous farm animals, including horses, had a full garden nearly an acre big, and so on. The best part of growing up there was the natural and relatively peaceful environment. I learned a lot of basic life skills and acquired some bedrock competencies there; it's very much a part of who I am.

Who or what influenced your decision to major in physics? My grandmother and John Galt. My grandmother influenced my decision substantially, as we worked through all the tasks and trials associated with farm life. She was a strong, well-educated and capable woman and taught me a great deal about planning, problem solving, and perseverance. Many problems we handled, like properly stacking bales of hay or driving a nail through oak, were basic engineering problems. She taught me that physics was the way to get to most of the solutions. About the time I was coming of age, when I was about 16, I read Ayn Rand's "Atlas Shrugged". I was very taken by the story and the philosophies expressed in it, and pursued the field of a primary character in the book. I don't think that was specifically conscious choice, but definitely ironic. Those two influences, coupled with the basic mathematical skills and desire to know "Why?", lead to the choice to pursue physics generally, and particle physics in particular.

#### **Tell us about your family.**

My wife, Nicola, and I have been together since 1987. She has two children from a prior relationship, and we had two together fairly early in our relationship. I went from single with no kids to married with four in about 4 years while I finished my bachelor's degree and started graduate school. Our son Blaise is now 18 and beginning classes this fall at Inver Hills Community College, and I'm sure he'll go on to eventually get an advanced degree once he figures out his desires a bit more. Our daughter Alexa is a senior in high school this year, and is already staged to attend any one of a number of fine schools for college. She's actually considering Physics at the U - we were on campus for the sneak preview a few weeks ago- and that sure would be awesome from my perspective. My stepson Dominick will turn 25 this Fall, and just graduated with a BS in Political Science from UW Superior and is now targeting a job with local government. My stepdaughter Ashela is 20 and taking classes part time at Inver Hills, while balancing a full time job at a well-known restaurant in the city and modeling with increasing frequency. We're very proud of all of our children, and eager to realize the upside of having our children when we were relatively young. They're nearly all launched, and we're in our prime - just like we planned! We're not in a particular hurry for grandchildren, however...;-)

**What are your hobbies?**

To be frank, I've been so occupied working and raising the kids, I've let most of my hobbies wane. I was always an avid reader, but I haven't read a fiction novel in quite some time, and I've only read a handful of non-fiction books over the last two or three years. It's been pretty much all I can do to excel at Seagate and keep up on technical literature, tend to the kids' needs and futures, and take what R&R I could. We have a lake home in Wisconsin we enjoy, and though I don't have the time I'd like to spend there I do find it relaxing just to hang out for a weekend or a few days here and there. We love to travel. Until recently, most of my traveling was for business. In the last few years we've done more traveling for our vacations and I find I enjoy it more each trip. I'm actually writing this on the penumbral day of a week in Florida visiting some family I haven't seen in a while. As the kids progress, we find ourselves in pretty good shape, and looking forward to tending to ourselves a bit more -physically, intellectually, and culturally.

**What are some of your beliefs on how to be successful personally and professionally?**

I believe very strongly in commitment: If you say you're going to do something, do it. My current situation is a testimony to commitment. One of the great joys I get - from my kids, or sometimes through my employees - is seeing them strive for something very difficult, being challenged to the point of concession, and finding ways to achieve the desired outcome. Conversely, be measured and thoughtful in the commitments you make, while recognizing you must ultimately commit to something at some point. The modern world has in my mind trivialized certain engagements and relationships, and too often people seem agreeable to things they really aren't. It's okay to be different, it's okay to see another way, and it's okay to express your views in a professional, respectful manner. Be true to yourself, and be prepared to go as far as that can take you.

**What advice do you have for current students and recent alumni?**

I try not to offer general or generic advice. I think what I would recommend is to be ever wary of complacency, and take nothing for granted.

**Is there anything else you would like us to know about you?**

I am very happy to be able to give back to the U in any way possible. I'm grateful for this opportunity to share my experiences at and love for the University.