Hellriegel eases communication between university biologists and company physicists who design microscopes. Zeiss and its competitors have been racing to produce high-end microscopes, meaning that there is ever more potential for positions like Hellriegel's.

Hellriegel moved to Zeiss from academia. He has lost the freedom to run his own experiments, but says that not having to write grant applications is well worth any downside. And he is still engaged in his favourite aspect of single-cell imaging — tinkering with microscopes. "One of the things that dawned on me is that there's a lot of thorough science that occurs in industry," he says. "I'm still helping to design equipment for biologists, only now I really have to make sure the equipment works well and is as user-friendly as possible."

Most jobs in single-cell imaging are in university departments and imaging centres. Eric Potma, a physical chemist at the Beckman Laser Institute at the University of California, Irvine, says that researchers should apply to universities at which there are already regular collaborations between imaging centres and medical schools or cell-biology departments. He adds that if the university is not equipped with the necessary high-end instruments and enough space, a large start-up package is essential. "I needed a package of about $1 million for the kind of work I do, in addition to plenty of space," he explains. His laser system, microscope, reagents, biosafety hood and incubator cost about $700,000. Another $300,000 went to support two graduate students and a postdoc for two years. "If you accept lower than what you really need," warns Potma, "your research won't be successful and you may not get tenure." A generous start-up is crucial, Gratton agrees, because it is nearly impossible for an investigator to get a federal grant to purchase high-end imaging equipment early in their career.

Graduate students and postdocs who are interested in single-cell imaging should seek out interdisciplinary labs, advises Singer. "It's great when the people who build the microscopes, make the probes and understand the biology get together in one place," he says. "It's really a great synergy and everything progresses quickly because you can bring a lot more breadth to the problem."

Despite the daunting amount of knowledge required to become an expert in single-cell imaging, those who succeed will be gainfully employed, says Singer. Potma sees the field as part of the progression towards better understanding of how cells contribute to health and disease. "There's still so much left to visualize," he says, "that I don't see an end to this field any time soon." ■

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# TURNING POINT
# Jonathan Cirtain

*On 26 September, Jonathan Cirtain, a solar physicist at NASA's Marshall Space Flight Center in Huntsville, Alabama, received a Presidential Early Career Award for Scientists and Engineers.*

**What made you pursue a scientific career?**
When I started college, I went to play American football at the University of Alabama in Tuscaloosa, but an accident in 1993 ended my football career. Lacking motivation, I didn't start college again until 1999 — after my dad made me promise to get a degree and stop wasting my life. He died two weeks later and I kept my promise. I started an undergraduate degree in mathematics and physics, subjects I'd always enjoyed, at the University of Memphis, Tennessee. I wanted to work for NASA or an outfit that supplied NASA with instrumentation. I thought that the best way to achieve that was to get a PhD in physics.

**How did you get interested in solar physics?**
At a conference of the American Astronomical Society I met Piet Martens, an astrophysicist at Montana State University (MSU) in Bozeman, who told me that his team would be opening a slot to work on NASA's Transition Region and Coronal Explorer (TRACE), which launched in 1998. The telescope took high-resolution images of the Sun's atmosphere, and MSU was involved in mission operations. As a graduate student, I got to operate the scientific payload. I was dropped into the middle of the action.

**How did you earn a predoctoral fellowship?**
The Sun's atmosphere had always looked fuzzy and out of focus in observations. It turns out that the community was not achieving the best resolution for engineering reasons. During my first year at MSU, I demonstrated a physical model for the Sun's atmosphere using observations from different instruments in space, and showed how imaging instrumentation should be altered to bring the Sun's atmosphere into focus. That caught the attention of Leon Golub at the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, and led to a predoctoral fellowship in 2004. Since then, my work has included helping to build the next-generation telescope for TRACE.

**How did you accelerate your academic career so quickly?**
While calibrating the Hinode X-ray telescope in 2005 at the Marshall Space Flight Center, I got to analyse the data and demonstrate performance. I became one of the few people who really understood the ins and outs of how the instrument works. I worked on my dissertation and defended it in March 2005. So, in 5 years and 10 months, I went from no undergraduate degree to a PhD.

**What are your next big launches?**
In June next year, as head of the solar-physics team, I'm going to launch a telescope that will offer a tenfold improvement over any previous extreme ultraviolet instrument. It is called the High Resolution Coronal Imager (Hi-C) and it will have 150-kilometre spatial resolution. A week before I launch that, I will launch the Solar Ultraviolet Magnetograph Instrument (SUMI), which will be used to infer the magnitude and direction of the Sun's magnetic field.

**Despite the economic challenges facing NASA, is now a good time to seek a space-related career in the United States?**
Perhaps I'm still young enough that I'm naive. The challenges that NASA faces are the ones the nation faces. This is a real economic crisis in the government; I don't think NASA is particularly different from any other agency. However, there is a shortage of US citizens pursuing careers in scientific instrumentation. Most of the graduate students who are interested in this area are foreign nationals. I think that's bad for the nation's scientific competitiveness. Now is as good a time as any to go into space-based astrophysics.

**To what do you attribute your career success?**
I don't think I'm a genius; I work hard and make the most of opportunities I'm given. I don't know how I would have got this far without my wife, whose support and willingness to move around with me have been extremely important. ■

INTERVIEW BY VIRGINIA GEWIN