



Tom Zirkle

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2017 Chateaubriand STEM Fellow

**University of Notre Dame - French Atomic Energy Commission, Grenoble
Electrical Engineering**

Tom Zirkle is a PhD candidate at the University of Notre Dame, and he was a Chateaubriand fellow in 2017 at the Commissariat à l'énergie atomique et aux énergies alternatives (French Atomic Energy Commission) in Grenoble, France for 6 months.

In which field did you carry out your research for your PhD and what was your specific area of study?

I am working on my PhD in electrical engineering and am conducting research in cryogenic measurements of nanoscale electronic devices. More specifically, I work with single-electron transistors and single-electron boxes for charge and voltage sensing applications.

What is your current occupation?

I am currently a PhD candidate at the University of Notre Dame working as a research assistant. I will be completing my degree in May and entering the work force as an electrical engineer with Northrop Grumman.

Please give a brief description of the work you completed in France:

While in France I worked with the quantum silicon group at CEA Grenoble. This group is exploring quantum dots in silicon for possible application as a qubits, the fundamental building blocks of a quantum computer. My work was focused on improving the measurement technique used to characterize the quantum dots called radio-frequency reflectometry. Reflectometry measures the change in a high-frequency voltage wave that is reflected off of the quantum dot as the charge state of the dot changes. In this way a very fast measurement of the state of the dot can be achieved, a crucial criteria for quantum computing. Furthering the state-of-the-art of this technique will play a key role in the realization of a large-scale quantum computer.

How was your experience as a researcher in France?

I really enjoyed my time working at CEA Grenoble. I had a really supportive adviser and my group had a large number of PhD students and Postdocs that were really welcoming. I wish I could have stayed longer just so I could keep working with my French colleagues. In addition to the great connection with fellow researchers, I had access to all the equipment I needed to complete my experiments. In short, nothing was lacking in my French research experience.

Did or will your research in France lead to any co-publications?

If yes, please describe (name of journal, date of publication):

I presented my work at a poster session for the Silicon Nanoelectronics Workshop 2018 in Honolulu, HI in June 2018. I also anticipate publishing these results as a part of my PhD dissertation and the implementation of my work in future research projects at the University of Notre Dame.

Did you or one of your supervisors present your work at a seminar? Do you plan on doing so?

If yes, please describe (name of seminar, date, type of presentation):

No, I do not believe this will be a part of a seminar.

In your opinion, did the Chateaubriand Program contribute to closer ties between your US and French labs (why or why not)?

The Chateaubriand Program is a great method to continue to build stronger ties between US and French labs. I can personally say that I made professional connections during my time in France that I will be able to use for the rest of my career. Furthermore, my exposure to France's language and culture adds to my resume and may make a path for me to return in a professional capacity in the future. Finally, my visit helped to strengthen the connection between my US and France labs and I am confident that our labs will continue to work together far into the future.

Did you improve your French while in France?

Absolutely! Nothing helps you learn a language like having to use it! I was sorry we left so soon since I was enjoying learning the language so much!

Do you plan on returning to France in the future?

If yes, please describe your plans:

I would love to return to France either for business or pleasure. My wife and I had so many positive and wonderful experiences while there we cannot wait to return!

Did you participate in any extracurricular activities or travel while in France?

The Chateaubriand Fellowship is so much more than just a research opportunity! France's public transportation and the walk-ability of so many of the great tourist locations allowed us to make many sightseeing trips. We were able to visit Paris, Avignon, Marseilles, the Alsace-Lorraine region, Strasbourg, Annecy, Cinque Terre in Italy, and so many more! We literally have thousands of amazing pictures from all our sightseeing adventures!