



## Tom Zirkle

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**Tom Zirkle is a PhD candidate at the University of Notre Dame, and he was a Chateaubriand fellow in 2017-2018 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!