

# Christopher Rey

## **Educational Background:**

Bachelor of Science in Physics from Loyola University New Orleans  
Ph.D. in Solid State Physics from Florida State University

## **Present company/position:**

Founder & President of Energy to Power Solutions (E2P)

## **Company Focus:**

Primary focus is: HTS cables, HTS/LTS magnets, generators and motors, magnetic energy storage, and cryogenic high voltage devices.

## **How did your education and early career lead to your initial and continuing interest in Superconductivity?**

When I was studying Physics at Loyola, my primary focus was Low Temperature physics and helium-3 cryocoolers. I was about to begin graduate school in January 1987 when High Temperature Superconductivity (HTS) was discovered. After that discovery, there was an explosion in the Superconductivity field and I became very interested in High Temperature Superconductivity. High Temperature Superconductivity and its related applications is the primary focus of my company today and I am still very interested in it. I was very lucky to be pursuing my degree when the discovery occurred. That discovery shaped my entire future in field.

## **What are some of your research interests?**

I'm honestly interested in all aspects of Superconductivity (low temperature and high temperature superconductivity). I have been involved in many different projects and aspects in the field such as accelerator magnets for high energy physics and fusion energy magnets. I have also had a substantial involvement in industrial electric power applications such as: HTS motors, generators, transformers and cables. I am still largely involved in the electrical power



industry and my interest continues to grow for this industry.

## **What are some of the most promising opportunities you see in the Superconductivity field?**

From my perspective and the projects my company has been involved in, I see numerous opportunities in electrical power and a wide variety of military type applications. A few years back, E2P was heavily involved in a project with the American Superconductor Corporation (AMSC) and the Naval Surface Warfare Center on HTS ship degaussing. In general, degaussing involves wrapping large cables around Navy ships that when energized appropriately make them less vulnerable to detection from magnetic mines. HTS cables make these degaussing systems significantly lighter than conventional copper cables. There are many opportunities right now to work on really interesting projects in Superconductivity with the military such as magnetic energy storage and electric power distribution.

## **Do you have any new or exciting projects/ventures you are working on that you would like to share with the community?**

I am excited to announce that I have edited a new book titled *Superconductors in the Power Grid*

The book will be available in May 2015 and is published by Elsevier Publishing. This is a review book containing informative chapters on various HTS electric power applications, written by highly experienced and extremely knowledgeable people in the field such as Dr. Alexis Malozemoff. The book also features some new chapters on fault current limiting HTS cables, which look promising from a commercialization perspective.

You can purchase the book on the E2P website ([www.e2pco.com](http://www.e2pco.com)) beginning in May.

I am also excited about the other projects our company is working on in energy storage with both the Air Force and ARPA-E. In addition, we are working on a new type of low-loss current lead for the Navy. Not only is the new type of current lead useful for military applications, it is something that will be beneficial to the entire Superconductivity community because it will be applicable to many (not all) superconducting magnet platforms.

## **How much international cooperation is going on in this field?**

Overall, there is a large amount of international cooperation in Low Temperature Superconductivity such as high energy physics and fusion energy. However, for High Temperature Superconductivity, the international cooperation is not the same. Since the Department of Energy shut down its base R&D program in 2010, most HTS related activities are now isolated and individual projects, with little international cooperation among teams. It would be great to see High Temperature Superconductivity grow and expand back into a more collaborative R&D effort.

Interview conducted by Erin Bise, IEEE CSC Administrator, April 2015