

## **Diamonds to Gin: Life as a Chemist in the Small Business World**

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Life can take many interesting and exciting turns working as a chemist/materials scientist/businessperson in the small business world. My journey started during graduate school working for my graduate advisor and quickly progressed to conducting and leading research efforts for several small businesses. In the first part of this presentation, an overview of working for small businesses will be given. Topics include the pros and cons of small business life and what to expect in small research organizations. A central thesis to this work is raising money for your research and for your company. My journey has been financed by government and private funding, angel investing, venture capital, and even going public.

Working in the small business world, a scientist/engineer will be involved with numerous and varied projects. Chemical vapor deposited (CVD) diamond films were at the core of my research for many years and will be discussed in detail. Diamond has the unique advantage in the material world of being just about the “best” at everything. Diamonds are the hardest material, have the highest thermal conductivity, are extremely chemically resistant, and are inherently superior insulators but can be doped into excellent conductors. They are also a wide band gap semiconductor and have a negative electron affinity. Diamonds are transparent throughout most of the EM spectrum making them the best optical windows of any material. They even make nice gemstones.

Finally, a brief overview of Tweaked Spirits, LLC will be presented. After years of working in a lab, it is about time to make something that everyone can enjoy!

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**Founder and President, Tweaked Spirits, LLC**

Dr. Donald E. Patterson is Founder and President, Tweaked Spirits, LLC, a craft distiller based in Dripping Springs, Texas. Dr. Patterson serves as the Head Distiller and Operations Officer for Tweaked. His current responsibilities include supervising all aspects of fermentation, distilling, and bottling. Concurrently, Dr. Patterson is a Lecturer in Chemistry at Texas State University – San Marcos and serves as a consultant for National Nanomaterials, Inc. His work at National Nanomaterials involves the fabrication of graphene and development of graphene-based cold cathodes. Prior to that, Dr. Patterson served as a Principal Scientist at Nanohmics, Inc (2004-2012). At Nanohmics, he supervised thin film development and worked on several R&D projects including the development of novel polymer systems, hard optical coatings, and unique microelectrical mechanical systems (MEMS). Dr Patterson also co-founded and served as the Executive Vice President, Research, Extreme Devices, Inc. (1998-2003). At Extreme Devices, he helped to develop diamond-based field emission devices for use in CRTs and other applications. Prior to Extreme Devices, Dr. Patterson was a Principal Scientist at Systems and Processes Engineering Corporation (1997-1998) developing vacuum microelectronics based on diamond field emitters. Dr. Patterson has also served as the Director of Research and Development and as a Senior Scientist for SI Diamond Technology, Inc., Houston, Texas. He was associated with SI Diamond from 1991 until 1996. Additionally, Dr. Patterson was a Senior Research Scientist and Head of Diamond Thin Film Research at the Houston Advanced Research Center (HARC) in the Materials Science Research Center (MSRC) in The Woodlands, Texas. Dr. Patterson was with HARC from 1989 until 1993. Dr. Patterson received his B.S. with honors (1982) and M.S. degrees (1984) in Chemistry at the University of Texas at El Paso and subsequently earned a M. A. (1987) and Ph. D. (1989) in Chemistry at Rice University in Houston, Texas.

Dr. Patterson is a member of the American Chemical Society and American Association for the Advancement of Science. He also belongs to the honor societies of Sigma Xi and Phi Kappa Phi.

His current research involves new materials synthesis for practical applications particularly in the fields of optics and electronics. At present, his interests include establishing a craft distillery and novel approaches for the synthesis of graphene. He has thirteen U. S. patents and a U. S. statutory invention. Dr. Patterson also has several patents pending and is the author or co-author of 74 publications and presentations.