

Program Report

PROF 1 There is life after the lab: Rationale and strategies for alternative careers

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Are you prepared to leave the laboratory in order to remain employed or to find a new job when few laboratory positions are available? Given trends in the chemical profession, one has should be prepared to prepared to leave the laboratory to engage in a non-laboratory career at any stage of one's career. These trends include long-term R&D cutbacks at many firms, increased reliance on offshore R&D facilities by many firms and increased use of new Internet-based methods of obtaining solutions to R&D problems.

After briefly reviewing the aforementioned trends, the speaker will describe the scope of alternative careers that employs the skills we have developed in our chemical education and employment.

Strategies for preparing for alternative careers will be discussed separately for the perspectives of undergraduate chemistry majors, graduate students in chemistry, employed mid-career chemists and unemployed mid-career chemists.

PROF 2 Technical writing: Research of a different kind

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Writing is a huge part of every scientist's professional career - peer-reviewed journal articles, proposals, letters of recommendation, exam questions, performance reviews, and much more. In some cases, writing scientific and technical documents can become a career in itself. Science, medical and technical writers and editors prepare documents of all kinds, for audiences ranging from the general public to specialized groups of scientists. While it is easy to get started as a writer, this leads to competition means it can be difficult to make a living at it. This talk will focus on how to get started in technical writing, and how to transition into this career. Many possible career paths will be discussed, and specific resources will be provided.

PROF 3 Middle school and high school teaching

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Middle school and high school teaching is one career choice available to chemistry majors. This career provides daily interactions with young people who are developing understandings of important scientific concepts and big ideas. Effective chemistry teachers possess not only a rich comprehension of the subject matter, but they also utilize creative approaches to teaching. Regardless of whether an individual is currently pursuing an undergraduate degree or already possesses one, the requirements for initial licensing in most states are the same. However, the path to initial licensure may be different. A current undergraduate can enroll in a teacher preparation program at her or his college or university. Someone who already holds a degree can also enter a traditional teacher preparation program, but may also seek initial licensing via an alternative route or by gaining admission to a master's degree program that leads to initial certification.

PROF 4 From a scientific research environment to manufacturing support in the electronic industry

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During one's tenure at a college or a university, the concept of research is clearly defined and usually the area of interest is narrow. Even in the industrial setting, research can be direction oriented and goal specific in terms of the company's business. However, once one enters into the world of manufacturing, an entire set of rules eliminates the concepts once considered essential by research. In the electronics industry, especially, problems can happen quickly and, on the manufacturing floor, problems do not lend themselves to long-term study and resolution. Instead, when entering into this world, one must use their chemical skills and minimum data to solve the daily occurring glitches found in the manufacturing arena. This talk will contrast the two "schools of thought" and discuss how research discipline can be transformed into Six Sigma concepts found in today's manufacturing business. Examples of work done at an electronics assembly company

PROF 5 Ignore alternative career options at your own risk: Alternative career case histories

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The range of non-laboratory careers in which chemists can utilize their skills and training are limited only by their imaginations. To illustrate this, various case histories will be presented. Alternative career options and how various chemists prepared for them will be described.

They include business management (including production), sales and marketing, patent attorney and patent agent, various types of science writing, textbook editor, finance and government regulations. Alternative laboratory careers include art conservator and forensic chemist. Some chemists began preparing for alternative chemistry careers while still in high schools. Others did so as their interests changed in the course of their careers. Some did so in response to unemployment. Some have a set of job responsibilities that combine many aspects of a laboratory career with those of various alternative careers.

PROF 6 Consulting: An ideal career for (some) technical professionals

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A consultant has been defined as a person who borrows your watch to tell you what time it is - and then sends you a bill. For a scientist working as a consultant, knowing how to read the watch takes a strong education coupled with years of experience. Technical consulting makes use of all the scientific, problem solving, communication, and personal management skills learned over years in large companies. It is a satisfying and rewarding career offering new challenges every day.

This paper tells how a physical chemist from the petroleum industry got into consulting and why. In it I will discuss some of the most important lessons I learned along the way. Chief among these is the importance of effectively marketing my skills.

PROF 7 Alternative certification and the "No Child Left Behind Act"

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One of the most important provisions of the historic No Child Left Behind Act (NCLB) is its requirement that all teachers of core academic content be "highly qualified" by the end of the 2005-2006 school year. As the Associate Deputy Under Secretary for Innovation and Improvement at the U.S. Department of Education, I will explain how the Department is working to ensure that "alternatively certified" teachers play an important role in helping school districts meet this goal. I will describe national initiatives to bring talented mid-career professionals from other fields into the classroom, especially in the critical areas of

science and mathematics. And I will explain how such teachers can make sure they are "highly qualified" under NCLB.

PROF 8 The alternative route to certification in New Jersey

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In 1985, the New Jersey Board of Education introduced the first "alternative route" to certification for qualified college graduates who have not completed professional education in a teacher training program. Alternative route candidates attend a program of formal instruction that takes place concurrently with on-the-job support and evaluation. More than 15,000 candidates have become certified this way. This is an information session about the alternative Route for Provisional Teacher program, including eligibility, test requirements, how to apply, formal instruction and other program aspects.

PROF 9 Find job security: Move from behind the bench to in front of the class

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When laboratories are closed, IPOs fail, reengineering or downsizing occurs, or there are just no positions for you to continue in your traditional scientific career, you might consider teaching at a secondary school. Both public and private high schools are interested in hiring experienced scientists to teach chemistry, physics, and mathematics. Schools at this level are rarely merged or go out of business. What can you expect to earn as a high school teacher compared to a traditional research position? Is a teacher's certificate required? Can you continue to do research? What are some summer opportunities for a teacher-scientists? What is a usual work load for a high school chemistry teacher. Who is generally responsible for the school laboratory? Can you find happiness and a sense of satisfaction teaching? What is the reality of teaching compared to the altruistic ideas about the impact of science teachers? The answers to these questions are based on statistical data and from anecdotal interviews with scientists who are presently high school chemistry teachers.

PROF 10 The alternative route to teaching as a viable employment option

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In today's economic climate downsizing is a way of life. This is true in all industries and the chemical industry is no exception. In most cases, there is no correlation between the downsizing and the competency of the individuals. The moves are based strictly on economics and change in business focus.

The effects of a layoff can be traumatic to both the individual and their immediate family. In an effort to restore some stability to their lives and those of their families, more and more people are turning towards teaching as a viable option. The reasons are twofold. First, there is a serious shortage of science teachers nationwide and this is especially true in the physical sciences of chemistry and physics. Secondly, with the demand for teachers in these areas so high, the security afforded to the people in these positions is also high.

In the state of New Jersey, there is a method called the Alternate Route where individuals with college degrees in specific subject areas may obtain a standard teaching certificate without re-enrolling in a four-year program. The scope of the presentation is to show the sequence of events that must occur in order for an individual to follow this route. It starts with signing up for the Praxis Exam and follows with the interview process, the twenty-day mentor, yearly mentor, the Alternate Route classes and finishes when the teacher receives tenure.

In addition to the sequence of events needed to receive a standard teaching certificate, the presentation will touch on the pros and cons of following the course.

PROF 11 Teaching: It's not what you think, it's even better

Daniel Rumack, Montville High School, Monville High School, 100 Horseneck Road, Monville, NJ 07045, drumack@monville.net

In September, 2003 I embarked on a new career. After 20 years in chemical research, I decided to become a high school chemistry teacher and accepted a position teaching college preparatory (1st year) chemistry and AP Chemistry in Montville, NJ.

In this presentation I will share some of my experiences as a first year teacher transitioning from industry. One may think that an experienced chemist would not need to spend much time in lesson preparation. Lesson planning is much more than learning the subject material. An effective teacher must be able to communicate at a variety of levels with students with varied interests and learning styles.

In addition to learning how to prepare effective lessons, a teacher is expected to maintain discipline in the classroom and interact successfully with parents. Success in these areas will greatly enhance your ability to implement your lesson plans.

With proper planning the experience of sharing your knowledge and love of chemistry can be a most rewarding one.

PROF 12 Globalization of chemical research: Historical trends vs. rosy scenarios

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Current trends in globalization affect much more than chemical R&D. Understanding what is happening now requires an understanding of technology and work flow trends that have been developing over the past 200 years. I will summarize some of the broad developments, and draw implications, both positive and negative, for today's chemical professionals competing in a rapidly changing world.

PROF 13 Industrial R&D in the People's Republic of China: Notes from the pioneers

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The number of western companies establishing laboratories in the People's Republic of China continues to grow in spite of a list of issues. These include, among others, intellectual property protection, difficulties actualizing promised government incentives, compensation differences between local hires and expatriates (particularly returnees), and establishing partnerships with universities and local businesses. This presentation highlights why laboratories locate in China, why China encourages such laboratories, experiences, learnings, and recommendations from the pioneers, and the outlook for these labs.

PROF 14 Offshoring of chemistry R&D jobs: Personal responses to the threat

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Offshoring of chemistry jobs is an important but complex one for chemists. For example, European drug firms have recently opened major U.S. R&D centers while U.S. firms are increasingly reducing U.S. chemical R&D employment while opening R&D centers in Asian countries. U.S. firms are also posting

R&D problems on websites where chemists from all countries can compete in solving the problem with the winner receiving a cash reward. At the same time, relatively more chemists are working for smaller firms less likely than large ones to open R&D centers and plants employing chemists in other countries.

While these trends will be briefly discussed, the focus of the presentation will be on how chemists can manage their career to reduce the possibility that it will be their jobs that will be moved offshore.

PROF 15 There is no looming shortage of chemists

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Basic premise: There is considerable public domain information that is consistent with the perspective that with today's glutted S&E labor markets, the lifetime of a chemistry "career" is a decade or two, at best. Given the paradoxical U.S. Dept. of Census result that science Ph.D.s have a lower median income than holders of science master's degrees and the recognition that the opportunity cost of a Ph.D. degree is typically twelve to fifteen years of B.S. level income, or about \$500K presently, the rationality of pursuing a chemistry Ph.D. is in question - particularly in light of the employer practice of cutting employee's positions just shy of them attaining 40 years of age, when the employee enjoys the theoretical protections of the Age Discrimination Act of 1967, as amended.

An historical overview of the policy changes during the last quarter of a century that yield the result of historically unprecedented gluts is necessary. The correlation between documented mass terminations of chemists by major employers and their subsequent hiring of non-immigrant visa holders is significant - given the present lack of protections of U.S. employment civil rights, such employer practices are perfectly legal.

PROF 16 Hiring the foreign national scientist: An industrial workforce need and immigration issue

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To be successful in industrial research and development, US corporations need to be able to hire the best talent. This includes doctoral scientists who are US-born as well as those coming to us from other countries around the world. Each year in this country, non-US citizens receive about 30% of all the doctoral degrees that are conferred in chemistry. In some departments, the proportion of foreign national students exceeds 50%. However, the ability of US corporations to employ such individuals is constrained by such immigration issues as the availability of temporary work visas (H1B) and the ability to obtain Permanent Residency status for their new hires. This presentation will discuss such issues in detail and highlight how they impact workforce development for the future.

PROF 17 Emerging issues in immigration: How to obtain immigration benefits in light of new security measures and visa processing delays

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The traditional methods to bring research and scientific talent into the United States continue to undergo close scrutiny by the Department of Homeland Security. With the addition of new security measures, visa application interviews and export control reviews at American Embassies and Consulates, visa applicants face increased hurdles in coming to the United States. This presentation will discuss the traditional visa categories used for employing scientific and research personnel in the United States, as well as some recent developments in the immigration laws that can impact securing top talent.

PROF 18 Government's role in offshore outsourcing

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State and Federal policy makers have responded to constituents' concerns about offshore outsourcing by proposing an array of potential legislative changes. Learn how your elected officials are trying to balance the needs of workers, companies, and society at large on this issue and the implications for the chemical enterprise.

PROF 19 The anatomy of a résumé

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How can you make sure your resume includes everything the employer needs to know about you? Will your resume transfer well as an attachment? How about when you upload it into an online application? Why do they say a resume should be only one page? Learn solutions to the gap in employment problem, how to show transferable skills, how to indicate personality characteristics. This poster will attempt to scientifically analyze the importance of format, concise language, number of pages, and type of font.

PROF 20 Escaping the career plateau trap

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Escaping the career plateau trap

Having a prepared strategy will let you escape the career control trap or avoid it entirely. Some chemists can spend years in a career plateau. The career plateau is when people cannot expect promotion in the foreseeable future. Most industrial chemists experience one or more career plateau during their career. The career plateau has become more common and occurs sooner in one's career as a result of reengineered corporate structures and current economic conditions in the chemical industry.

This poster will describe: causes and symptoms of the career plateau, problems of the career plateau and solutions to these problems. Solutions include outstanding job performance, acquiring new competencies, lateral job transfer, outlasting the boss and getting a new supervisor, job enrichment of your current assignment, professional enrichment outside your job and changing jobs

The advantages and disadvantages of these solutions will be discussed.

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WITHDRAWN

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that leads to initial certification.

PROF 22 Failure analysis: Using chemistry to solve real life problems

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In the world of electronic assemblies, the various components continue to get smaller and more complex. When a system failure occurs, usually it is a component that has failed. The science of failure analysis attempts to recreate the reason for the electronic assembly malfunction. This type of analysis requires both a knowledge of electronics and now, more than ever, chemical knowledge of materials. With integrated circuitry and specialized hybrid components that are coated or covered in polymeric materials, analysis requires the expertise of chemists and material scientists to unlock the hidden features of today's electronic components. Just getting the circuitry exposed without damaging the unit or eliminating the reason for the component failure is a chemical quandary at times. Once the circuitry is exposed, analytical reasoning based on knowledge of chemical reactions and mechanical properties are necessary to solve the reason for the failure. From batteries to intricate semiconductors, the world of failure analysis needs to expertise of a chemist.

PROF 23 Consulting: An ideal career for (some) technical professionals

WITHDRAWN

A consultant has been defined as a person who borrows your watch to tell you what time it is - and then sends you a bill. For a scientist working as a consultant, knowing how to read the watch takes a strong education coupled with years of experience. Technical consulting makes use of all the scientific, problem solving, communication, and personal management skills learned over years in large companies. It is a satisfying and rewarding career offering new challenges every day. This paper tells how a physical chemist from the petroleum industry got into consulting and why. In it I will discuss some of the most important lessons I learned along the way. Chief among these is the importance of effectively marketing my skills.

PROF 24 About the Chemical Consultants Network

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The Chemical Consultants Network (CCN) was established in December 1994 as a non-profit organization, and has held monthly meetings since February 1995. We believe that CCN is the first and only organization for consultants within the American Chemical Society. The name "Chemical Consultants Network" was adopted to reflect the purpose of the group, which is to enhance its members' opportunities to use their professional expertise as consultants. CCN's mission is to support its members by expanding the meaningful use of their expertise via: „« Providing advice and training via talks, seminars and workshops. „« Establishing and maintaining a database of the membership and of the members' areas of interest. „« Providing a networking environment via monthly meetings and distribution of the database. „« Maintaining a website for the benefit of its member. o Provides potential clients a self-service consultants resource. „« Developing and implementing a publicity program.
