

# Career Information in the Mathematical Sciences

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A Resource Guide

## **Conference Board of the Mathematical Sciences Member Societies**

American Mathematical Association of Two-Year Colleges

American Mathematical Society

American Statistical Association

Association for Symbolic Logic

Association for Women in Mathematics

Association of State Supervisors of Mathematics

Institute of Mathematical Statistics

Mathematical Association of America

National Association of Mathematicians

National Council of Supervisors of Mathematics

National Council of Teachers of Mathematics

Operations Research Society of America

Society for Industrial and Applied Mathematics

Society of Actuaries

The Institute of Management Sciences

*This guide is produced by the CBMS Societies with support  
from the U.S. Department of Energy*

Editor

*Andrew Sterrett*



CONFERENCE BOARD OF THE MATHEMATICAL SCIENCES  
1829 Eighteenth Street, N.W., Washington, DC 20036  
(202) 293-1170

## **INTRODUCTION**

The Conference Board of the Mathematical Sciences has put together this guide to provide a resource list of career materials for parents, counselors, and teachers at all levels. Our goal is to provide these groups with information about careers in the mathematical sciences and careers which depend on a solid background in mathematics. The Conference Board itself represents people working in both these areas. The guide contains both written and videotaped material appropriate for junior high through university students.

As a mathematician working in industry, I am often approached by parents of young men and women who are good students in mathematics. "What kinds of jobs are available for my daughter? She's really good in math!" they might say. The good news is that, as our society increasingly depends on science and technology in almost every economic sector, mathematics becomes an even more important component of the requirements for a wide spectrum of careers. The mathematical sciences themselves offer a rich and varied selection of jobs. Mathematics is the key which can open the door to many career opportunities.

*Jill P. Mesirov*  
Chair, CBMS

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## **PARENTS**

### **1. Mathematics: The Language of the 21st Century**

Pamphlet. Shows parents of young children that "mathematics is more than arithmetic," and tells why their children should study mathematics. Free.

*Mathematical Sciences Education Board*

2101 Constitution Avenue, NW, HA476

Washington, DC 20418

### **2. You Can Help Your Young Child Learn Mathematics**

Pamphlet. Provides family activities that help young children see practical uses of mathematics. Also available in Spanish. Free.

*Office of Research and Improvement*

*U.S. Department of Education*

555 New Jersey Avenue, NW

Washington, DC 20208-5648

**J**ust as evolutionary niches inevitably disappear, so do careers that cannot change with the times. So how does someone prepare for such an unpredictable future? The key is to learn how to think, and be able to adapt to new challenges. This is why I believe that mathematics is so valuable as an academic background.

— *Edward F. Preston, Systems Engineer  
at the MITRE Corporation*

## JUNIOR HIGH SCHOOL STUDENTS

### 3. The Challenge: A Kid's Introduction to Engineering

Video. An upbeat, 33 minute video designed to introduce 10-to 13-year old children to engineering careers before the 8th/9th grade crossroads, the critical point at which they decide whether to take Algebra 1 and academic track science. Photographs of on-the-job activities at AT&T Bell Laboratories, Dupont, Ford, Exxon, GE Aerospace, and IBM.

Write to NACME for a complete list of their publications.

*National Action Council for Minorities in Engineering (NACME)*  
3 West 35th Street  
New York, NY 10001

### 4. Connecting the Past with the Future: Women in Math and Science

Video. Features the historical contributions of Ada Lovelace as well as modern day role models who use mathematics that relates to the work of Lovelace in their careers. Three booklets accompany the tape. \$25.00. Three additional tapes will be produced.

*Judith Olson*  
Department of Mathematics  
Western Illinois University  
Macomb, IL 61455

**I** majored in mathematics because I liked the subject but I have used my training more ways than I ever imagined possible.

*Debra W. Taufen,*  
*Marketing Manager at IBM*

## CROSS REFERENCES

### CBMS SOCIETIES

*The following reference numbers contain those career materials published by members of the Conference Board of the Mathematical Sciences:*

American Mathematical Society 36, 37  
American Statistical Association 22, 33, 34, 35, 55  
Association for Women in Mathematics 16  
Mathematical Association of America 19, 20, 21, 40, 53  
National Council of Teachers of Mathematics 8  
Operations Research Society of America &  
The Institute of Management Science 9, 17, 18, 31, 32, 52  
Society of Actuaries 23, 24, 38, 39, 54  
Society for Industrial and Applied Mathematics 15, 51

### INTEREST GROUPS

*The following reference numbers contain publications that are of interest to special groups of students:*

Disabled students 30  
Engineering 3, 10, 11, 12, 13, 14, 41, 42, 43, 44  
Graduate School 18, 36, 39, 47  
Job Hunting 40, 41, 42, 43, 44, 45, 46  
Mentoring 7  
Minority students 3, 24, 35  
Posters 29  
Videos 3, 4, 5, 6, 9, 13, 14, 22, 30, 32  
Visiting Lecturers Programs 51, 52, 53, 54, 55  
Women students 4, 6, 7, 12, 16, 34



## JUNIOR HIGH/SENIOR HIGH SCHOOL STUDENTS

### 5. FUTURES

Videos. Twenty-four 15-minute videos designed to be used by teachers in grades 7 to 12 to help motivate students to study mathematics and science. Interviews with professionals in many fields show how mathematics is the foundation for many exciting careers. Jaime Escalante is host of the series.

#### *FASE Productions*

4801 Wilshire Boulevard, Suite 215  
Los Angeles, CA 90010

### 6. Nothing But Options

Video. Profiles five interesting young women in a variety of math/science careers including environmental science, electrical engineering, computer graphics, financial investing and computer science analysis. Winner of National Educational Film Festival Award. Purchase price, \$75.00.

Also write for additional information about careers for women.

#### *Math Science Network*

Preservation Park  
678 13th Street, Suite 100  
Oakland, CA 94612

### 7. Math Mentoring

A career consulting and mentoring program designed to encourage young women in mathematics and science. Write for more information.

#### *Women and Mathematics*

Dr. Virginia E. Knight  
Department of Mathematics and Computer Science  
Meredith College, Raleigh, NC 27607

or

#### *Women and Mathematics*

Mr. Carolyn Tucker  
Westminster College of Salt Lake City  
Salt Lake City, UT 84105



## SENIOR HIGH SCHOOL STUDENTS

### 8. Shape the Future: A Career as a Mathematics Teacher

Pamphlet. The NCTM makes the case for a career as a mathematics teacher and how to prepare for it. Copies are free.

*National Council of Teachers of Mathematics (NCTM)*  
1906 Association Drive  
Reston, VA 22091-1593

### 9. Operations Research Educational Outreach Kit

Designed to motivate secondary school students, especially minorities and women, to take mathematics and science courses every year. This kit consists of a 19-minute videotape, "Operations Research + You = An Exciting Career," a student/teachers' guide; a double-sided, double density IBM DOS-based 5.25" diskette and an Apple Macintosh 3.50" diskette of major Operations Research solution procedures as illustrated on the tape and in the student/teachers' guide; detailed instructions and student activities for both IBM and Apple PC's; an informational booklet -- "What is ORSA?"; and a self-addressed, stamped, teacher survey form. The kit is available for \$7.99 postpaid (Maryland residents, add 6% sales tax).

*Operations Research Society of America (ORSA)*  
1314 Guilford Avenue  
Baltimore, MD 21202

### 10. What is a Mechanical Engineer?

Pamphlet. Intended for high school students. ASME also will send several other brochures and pamphlets that deal with mechanical engineering.

*The American Society of Mechanical Engineers (ASME)*  
345 East 47th Street  
New York, NY 10017-2392

### 11. Careers in Electrical, Electronics, and Computer Engineering

Pamphlet. Lists courses to study in high school as well as extra-curricular activities that enhance one's preparation for college.

*The Institute of Electrical and Electronic Engineers, Inc. (IEEE)*  
345 East 47th Street  
New York, NY 10017-2394

## VISITING LECTURER PROGRAMS

The following CBMS societies have Visiting Lecturer Programs and will provide lists of potential speakers on topics in the mathematical sciences for college and university audiences:

**51. Society for Industrial and Applied Mathematics**  
3600 University City Science Center  
Philadelphia, PA 19104-2688

### 52. Operations Research Society of America & The Institute of Management Sciences

1314 Guilford Avenue  
Baltimore, MD 21202

Also available, the ORSA/TIMS Chapter Directory.

This document provides a list of local chapter officers for ORSA/TIMS chapters.

### 53. Mathematical Association of America

*Attention: Jane Heckler*  
1529 Eighteenth Street, N.W.  
Washington, DC 20036

### 54. Society of Actuaries

*Attention: Pat Holmberg*  
475 North Martingale Road  
Schaumburg, IL 60173-2226

### 55. American Statistical Association

1429 Duke Street  
Alexandria, VA 22314-3402

## 50. Take the CPA Challenge: Careers in Accounting

Pamphlet. Contains brief introductions to several careers in accounting. Up to 25 copies free.

*Relations With Educators Division*  
*American Institute of Certified Public Accountants*  
1211 Avenue of the Americas  
New York, NY 10036-8775

## 12. Is Engineering for You?

Four-panel pamphlet for high school students. Provides one-paragraph descriptions of twenty engineering fields. SWE, a non-profit, educational service organization, will send additional information as well as this pamphlet.

*Society of Women Engineers (SWE)*  
120 Wall Street, 11th Floor  
New York, NY 10005-3902

## 13. Chronicle Occupational Briefs and other print and video material.

Briefs that describe math-related fields are available as a package. Write to the address below for more information.

*Chronicle Guidance Publications, Inc*  
P.O. Box 1190  
Moravia, NY 13118-1190

## 14. JETS

A nationwide organization for pre-college students interested in engineering, technology, mathematics, and science. Write for information regarding print and video material.

*JETS, INC*  
1420 King Street — Suite 405  
Alexandria, VA 22314-2715

**W**hen seeking a mathematical position, don't be put off the trail by titles of jobs or work units that may not seem mathematical. Mathematicians can pop up, and do mathematical work all over the place.

— *Michael D. Weiss,*  
*Agricultural Economist,*  
*U.S. Department of Agriculture*

**I** was concerned that I might have difficulty being admitted to medical school, not being a typical pre-med. I found that doing well in mathematics opened the doors to the very best medical schools. The vigorous discipline in training in analytical thought processes prepared me extremely well for medical school. I found no other courses that were more rigorous than those that I had encountered in my mathematics courses.

*Arthur P. Staddon, M.D.,*  
*Clinical Associate Professor of*  
*Hematology-Oncology at the University*  
*of Pennsylvania School of Medicine*

## HIGH SCHOOL/COLLEGE STUDENTS

### 15. Careers in Applied Mathematics

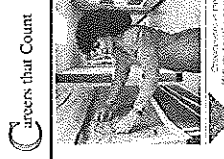
Pamphlet. Aimed primarily at college freshmen and sophomores, although high school seniors with interest in mathematics (and juniors with strong aptitude) might also benefit from reading it. Includes samples of applied mathematics problems, information about what applied mathematics jobs entail, course areas that may be useful, skills that are valuable on the job, and references. Jobs appropriate for B.S., M.S., and Ph.D. degree holders are mentioned. One copy free.

*Society for Industrial and Applied Mathematics (SIAM)*  
3600 University Science Center  
Philadelphia, PA 19104-2688

### 16. Careers that Count

Booklet. Profiles sixteen women with careers in the mathematical sciences. The subjects range over the whole spectrum of mathematical professions, from university research to school teaching, from industry to government, from finance to medical research. A bibliography of popular mathematics books is included. \$1.50 per copy (\$1.00 per copy on orders of 10 or more).

*Association for Women in Mathematics (AWM)*  
4114 Computer & Space Science Bldg.  
University of Maryland  
College Park, MD 20742



### 17. Careers in Operations Research

Booklet. Describes careers available to the Operations Research analyst and the educational requirements for entry into the field. Lists educational institutions offering undergraduate and graduate degrees in operations research. Up to four copies are free; \$.70 per copy, 5-30 copies; \$.60 per copy for 31 or more.

*Operations Research Society of America (ORSA)*  
1314 Guilford Avenue  
Baltimore, MD 21202

### 46. Math and Science in the Peace Corps

Brochure. Directed toward college seniors and recent graduates. Includes information about benefits and eligibility.

*Peace Corps of the United States of America*  
Box 941  
Washington, DC 20526

### 47. Prentice Hall Guide to Scholarships and Fellowships for Math and Science Students

Book. Chapters: A Few Helpful Hints in Applying for Financial Aid, Undergraduate School, Graduate School, Figuring Financial Aid, Scholarships, Fellowships, Contests and Competitions, Internships and Summer Employment, Study Abroad, Other Resources, Taxability of Scholarships and Fellowships, Suggested Readings. Mark Kantrowitz and Joann P. DiGennaro. 325 pages, 1993, \$19.95.

*Prentice Hall, Inc.*  
113 Sylvan Avenue  
Career & Personal Development  
Englewood Cliffs, NJ 07632

### 48. Careers for Number Crunchers

Book. Contains dozens of descriptions of jobs that involve the application of quantitative techniques. Numerous Number Crunchers describe their experiences and explain how they turned their quantitative aptitude into rewarding careers. Rebecca Burnett, 1993.

*National Textbook Company*  
4255 W Touhy Avenue  
Lincolnwood, IL 60646

### 49. Career Choices for the 90's for Students of Mathematics

Book. Another book for the number crunchers, with chapters on accounting, banking, computing, data processing and information systems, insurance, manufacturing, real estate, securities, and software. 1990.

*Walker Publishing Company, Inc.*  
720 Fifth Avenue  
New York, NY 10019

#### **42. CPC Annual, Volume 1: A Guide to Career Planning, the Job Search, Graduate School, and Work-Related Education (Four-Year College Edition)**

Provides general information about planning for one's career and searching for jobs. 1992/93, \$5.95

*College Placement Council, Inc. (CPC)*  
62 Highland Avenue  
Bethlehem, PA 18017

#### **43. CPC Annual, Volume 3: A Guide to Employment Opportunities for College Graduates in Engineering, Sciences, the Computer Field, and Other Technical Career Options**

Consists of 1) various indices to assist in locating employers and 2) narratives in which employers describe their organizations, locations, history, products or services, plans for the future, and benefits. 1992/93, \$16.75

*College Placement Council, Inc. (CPC)*  
62 Highland Avenue  
Bethlehem, PA 18017

#### **44. CPC Salary Survey**

The CPC Salary Survey is a study of 1992-93 beginning offers to college graduates at 402 institutions. It is available only to members of CPC and to Salary Survey subscribers.

*College Placement Council, Inc. (CPC)*  
62 Highland Avenue  
Bethlehem, PA 18017

#### **45. Computer Graphics Career Handbook**

Book A very complete description of opportunities in computer graphics, arranged under the following chapters: Categories, Career Profiles, Colleges and Universities, Company Statistics, and The Job Search Process. Member price, \$16.00; Non-member price, \$20.00.

*Association of Computing Machinery (ACM)*  
ACM Order Department  
P.O. Box 64145  
Baltimore, MD 21264

#### **18. Educational Programs in Operations Research**

Brochure. Features one-page descriptions of more than 120 educational programs in operations research available in the United States and Canada. Useful to undergraduate students seeking information about graduate programs. Also helpful to high school students in long range educational planning. One copy is free; write/call, (410)528-4146 for quantity prices.

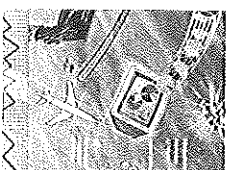
*Operations Research Society of America (ORSA)*  
1314 Guilford Avenue  
Baltimore, MD 21202

#### **19. Mathematical Scientists at Work**

Rooklet. Career essays written by teachers, applied mathematicians, statisticians, computer scientists, and actuaries. Enhanced by photographs and mathematics stamps.

1-9 copies, \$3.00 each; 10-49 copies, \$2.75 each; 50 or more copies, \$2.50 each.

*Mathematical Association of America (MAA)*  
1529 Eighteenth Street, N.W.  
Washington, DC 20036



#### **20. Careers in the Mathematical Sciences**

##### **21. More Careers in the Mathematical Sciences**

Pamphlets. Brief autobiographies of six authors who describe the role that mathematics has played in their careers. Single copies free. Each brochure: 2-99 copies, 25 cents each; 100 or more copies, 20 cents each.

*Mathematical Association of America (MAA)*  
1529 Eighteenth Street, N.W.  
Washington, DC 20036

## 22. What is Statistics?

Video. Excerpted from the Annenberg PBS series of the same name that was distributed to all PBS stations in 1990. This is a general, "real world" introduction to the concept of statistics and how they are applied to everyday situations. The purchase price is \$25 for members of ASA or educators; \$50 for nonmembers, plus postage per tape (U.S. \$4, Canada \$7).

*American Statistical Association (ASA)*

1429 Duke Street

Alexandria, VA 22314-2402

## 23. The Actuarial Profession

Booklet. Provides a concise description of the actuarial profession including information on what types of work actuaries do, educational preparation needed to enter the field, the actuarial examinations, and salaries. There are also six brief interviews with practicing actuaries. Includes an order form for obtaining additional publications, including a list of Canadian and U.S. schools offering actuarial mathematics. Copies are free.

*Society of Actuaries (SOA)*

475 North Martingale Road

Schaumburg, IL 60173-2226



## 24. Actuaries at a Glance: Minorities in the Actuarial Profession

Booklet. Brief description of the actuarial profession with emphasis on the opportunities available to minorities. Most of the booklet is devoted to interviews with minority members of the actuarial profession. Copies are free.

*Society of Actuaries (SOA)*

475 North Martingale Road

Schaumburg, IL 60173-2226

## 38. Preliminary Actuarial Exams

Booklet. Sample questions for the first two actuarial examinations are included along with answer keys. The first exam covers calculus and linear algebra, the second, probability and statistics. Very useful for anyone contemplating taking the exams. Copies are free.

*Society of Actuaries (SOA)*

475 North Martingale Road

Schaumburg, IL 60173-2226

## 39. Actuarial Training Programs

Booklet. Provides information on some of the training programs available for actuaries, including both full-time actuarial positions as well as student internships and summer employment. Companies with their addresses and telephone numbers are grouped geographically. Although the entries do not necessarily represent immediate job opportunities, this is an excellent reference for job seekers. Copies are free.

*Society of Actuaries (SOA)*

475 North Martingale Road

Schaumburg, IL 60173-2226

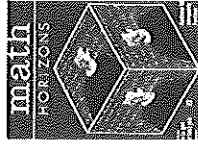
## 40. "Seven Steps to Finding a Job"

Written especially for mathematics majors, this article describes how to go about finding one's first job. Mary Schilling, MATH HORIZONS, Vol. 1, No. 1, 1993, \$3.00

*Mathematical Association of America (MAA)*

1529 Eighteenth Street, N.W.

Washington, DC 20036



## 41. Peterson's Job Opportunities for Engineering, Science, and Computer Graduates, 1993.

Chapters include The Job Outlook, Take Charge of Your Job Search!, A Guide to Career Areas, Employer Profiles, In-Depth Employer Descriptions, Directories of Employers, Resources for the Job Hunter, and Index of Employers. \$20.95.

*Peterson's Customer Service at (800) 338-3282*

**S**tudents often ask me what to take in school...my answer?...follow your natural instincts but take lots of math!

*Thomas E. Dunham,  
Vice President and General  
Manager at General Electric*

### 34. Women and Statistics

Brochure. A 12-page brochure detailing the role of women in statistics from early pioneers to today. Includes profiles of women statisticians and provides information on salary levels and how to become a statistician. Single copy free.

*American Statistical Association (ASA)*  
1429 Duke Street  
Alexandria, VA 22314-2402



### 35. Minorities! Looking for a Challenging Career?

Brochure. Designed to encourage minority students to consider the profession of statistics. Describes the type of work and the opportunities in a profession where there continues to be more jobs than qualified statisticians and outlines the typical program of study and salary ranges. Single copy free.

*American Statistical Association (ASA)*  
1429 Duke Street  
Alexandria, VA 22314-2402

### 36. Assistantships and Graduate Fellowships in the Mathematical Sciences

A "must" for prospective graduate students. Contains information on most U.S. graduate programs in the mathematical sciences, including, for example, teaching assistants, fellowships, the number and types of degrees offered, and special national fellowships. \$18.00.

*American Mathematical Society (AMS)*  
P.O. Box 6248  
Providence, RI 02940

### 37. What's Happening in the Mathematical Sciences

Magazine. This colorful, readable survey for undergraduate students documents recent, important developments in the mathematical sciences. It depicts how mathematics contributes to the solution of scientific, engineering, and medical problems. Free; \$4.00 for postage and handling. Write for the cost of bulk copies.

*American Mathematical Society (AMS)*  
P.O. Box 6248  
Providence, RI 02940

### 25. The Jobs Rated Almanac, Les Krantz

Book. Two hundred fifty jobs are rated by more than a dozen classifications, followed by an overall ranking. Jobs that require mathematics rank extremely high. Examples: #1 software engineer, #2 actuary, #3 computer systems analyst, #4 computer programmer, #5 mathematician. \$15.95. 1992.

*Pharos Books*  
200 Park Avenue  
New York, New York 10166

### 26. Computer and Mathematics-Related Occupations

This 17 page bulletin includes information about accountants and auditors; actuaries; computer programmers; computer systems analysts; economists; marketing research analysts; engineering, science; data processing managers; mathematicians; operations research analysts; and statisticians. For each occupation, information is provided on working conditions; employment; training, qualifications, and advancement; job outlook; earnings; and related occupations. 1992/93. The bulletin is updated every two years. \$2.00. Bulletin 2400-4.

*Division of Occupational Outlook, U.S. Department of Labor*  
Bureau of Labor Statistics  
Washington, DC 20212

### 27. System of Interactive Guidance and Information PLUS (SIGI PLUS)

SIGI PLUS is a tool for helping students plan their careers. It combines the capabilities of a computer with information about occupations, values, interests, skills, and educational programs. Includes Tech Prep information. Phone (800) 257-7444 for a complimentary demonstration diskette.

*Educational Testing Service*  
P.O. Box 6403  
Princeton, NJ 08543-5071

### 28. Discover

Computer software. A source of assistance for students who are unsure what they want to do after high school. The system contains on-line exercises for inventing and rating interests, abilities, experiences, and values. Phone (410) 584-8000 for more information

*American College Testing Program*  
230 Schilling Circle, Suite 350  
Hunt Valley, MD 21031