ASSOCIATION FOR WOMEN IN MATHEMATICS

NEWSLETTER

Volume 6, Number 3 REPORT FROM THE PRESIDENT

CBMS

The AWM is now an affiliate member of the CBMS (Conference Board of the Mathematical Sciences, the umbrella organization of mathematical societies). In fact, we are the first organization admitted under the newly established CBMS admission criteria. An article about the AWM appears in the January-February CBMS Newsletter.

I see our membership in the CBMS as having various important consequences. For one, it demonstrates official recognition by the mathematical community of the AWM's integral role and impact on this community. But more importantly, it will give us an additional opportunity to effect direction and change.

The CBMS is now anxious to take on new projects and has asked its member organizations for suggestions. We plan to ask the CBMS to sponsor a study to assess the real effect of affirmative action on the mathematical community, both in and out of academia. It seems quite apparent that the employment situation should be of prime concern to the CBMS. This problem should be attacked in some comprehensive way, not only in terms of alleviating the immediate situation, but also in terms of changing attitudes and prejudices in the mathematical community at large. For example, the desirability, even the wisdom, of an inflexible and rigid vision of mathematics needs to be questioned. Mathematicians should be prepared for, and be able to find, viable and creative alternatives to academic employment. Anyone who feels complacent with the status quo ought to visit the job registry at the next math meetings. It is outrageous that so many talented and highly trained people find themselves in the untenable position of competing for the few academic jobs available.

I attended my first CBMS Council meeting on Sunday, January 25, in San Antonio as the AWM representative. One of the issues discussed was various possible alternative non-traditional modes of NSF support of mathematical research. William Pell, head of the NSF Mathematical Sciences Section, discussed some ideas under study, including a "Mathematical Sciences Institute" somewhat on the order of the Institute for Advanced Study in Princeton, "movable institutes", "special years", and expanded support of small research conferences. NSF would like to get a feeling for what the mathematical community wants in this regard. There appears to be a push for the "Institute", although I have heard strong arguments, both pro and con. It seems to me that for an "Institute" to be a real alternative, it would certainly have to be quite visionary in its view of the potential and scope of the mathematical sciences.

Another issue discussed was the public understanding project, various aspects of which are: expository writing, contacts with professional science writers, exploration of other modes of communication. The recent Newsweek article on catastrophe theory (Jan. 19, 1976) was cited as a direct outgrowth of this project. In addition, a mock issue of "Mathematical World", a general mathematical magazine, was circulated and the feasibility and desirability of its regular publication was discussed.

If you have ideas for CBMS projects, please let me know. Indeed, I would appreciate any suggestions or comments about all this.

AWM Panel

Our panel, "Women Mathematicians in Business, Industry and Government", at the San Antonio meetings was a tremendous success. About 200 people attended, and there has been a lot of enthusiastic response to the dynamic and informative presentations. Some of the topics disussed were: job conditions, rewards and difficulties, how to find out about openings, and the transition to non-academic employment. A common thread seemed to be: a need for a flexible and open attitude and a willingness to work on a variety of problems, and with other people. The talks will be published in the Newsletter.

I would like to thank the panelists for their extremely thoughtful and stimulating talks: F. Jessie MacWilliams, Bell Laboratories (coding theory), Patricia Mallion, Addison Wesley (editorial assistant in the science and math division); Vera Pless, University of Illinois, Chicago Circle (coding theory, worked for 10 years at Air Force Cambridge Research Labs); Marijean Seelbach, NASA-Ames Research Center (background in functional analysis and topoloy, works in optimal control theory); Marjorie L. Stein, U.S. Postal Service (statistical systems requirements); Mary F. Wheeler, Rice University (numerical solutions to p.d.e.'s, oil company

March-April 1976

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consultant).

Many thanks also to Mary Gray, Alice Schafer and Martha Smith for assisting me in contacting the panelists.

AWM Reader and Newsletter Index

The Newsletter is now in its sixth year of publication and has contained many interesting and important articles. It would be very valuable to have a cummulative index, and also to have various articles in one place. For example, we are constantly getting requests for information about women in mathematics. Hence, we have been thinking of publishing an index and also an AWM Reader that would contain some of the more important articles from the Newsletter, reprints of relevant articles from other sources, some new articles, essays and editorials commenting on the literature and drawing the material together. We would like to start work on this publication next summer. If you have suggestions of pleces that should be included, or if you would like to write something, or work on this publication, please let me know.

Employment Situation in Academia

According to a February, 1976 report from the U.S. Office of Education, women on the faculties of the nation's colleges and universities lost ground in both salary increases and rank last year. Women's salaries increased 5.8% overall compared to 6.3% for men. Women accounted for 24% of all faculty members in academic year contracts, the same as in 1974, but there were fewer female professors, associate professors and instructors, and more assistant professors, lecturers and undesignated positions than in 1974. The data is based on responses from 2782 campuses. And on the U.C. Berkeley campus, a report issued on January 27 by an Academic Senate committee confirmed this backward trend by pointing out that the percentage of women appointed last year dropped from 25% in 1974 to 15.8% last year. The report also recommended to the Chancellor "the inclusion of a report on affirmative action efforts and progress in the periodic review of departments, schools and other campus units". In early February, a committee personally appointed by, and with charges from, Calvin Moore, Dean, conducted a review of the U.C. Berkeley Math Department. The AWM suggested that critical to a responsible review was an investigation into the long history of discrimination against women and minorities in the department. John Kelley, Math Department Chairman, passed on our suggestion to the committee and further requested that these matters be seriously considered. However, a reply from the committee stated "it would be inappropriate to broaden our charge unilaterally and attempt to conduct an investigation along these lines". We conclude that the Dean is fearful of an outside investigation into these matters.

Briefly

-Mary Gray will be handling discrimination cases. If you feel you have been discriminated against and need advice, contact her at: Department of Mathematics, American University, Washington, D.C. 20016. Also, we would like to know if you are getting requests for vita and you suspect it may be just for the purpose of "papering files".

-AWM needs money and Christine Stokes needs help in writing proposals and contacting various foundations for funds. Your help here would be greatly appreciated. Contact Christine at: Department of Mathematics, University of Mississippi, University MS 38677.

-AWM would like to initiate Mathematics Achievement Awards for high school girls. I think this would most appropriately be handled at the regional level. Let me know if you have any ideas on this.

-Next summer at the Toronto meeting we are planning to have an in depth discussion on the history of women in mathematics and their mathematics. I am especially interested in hearing from people who would be willing to discuss and put some perspective on various women's lives and mathematical contributions.

-Sophie Germain's bicentennial birthday is April 1, 1976. There will be a celebration in Washington, D.C.. Contact Mary Gray for details.

Welcome to New Members

I would like to thank everyone who has informed colleagues about AWM and circulated my letter. The Wellesley office tells me that there has been a good response. I would like to welcome all new members.

Office address:	Dept. of Mathematics & Computer Science	Home address: /00 Euclid Ave.
OTITCE address.	will aller Ochland CA 9/613	Berkeley, CA 94708
	Mills College, Oakland, CA 94015	because); on prior
	(415) 632-2700 X347	(415) 525-8730

ANOTHER WOMEN'S NEWSLETTER...This one is called Washington Women's Representative, is oriented not only towards telling you what is going on, but who to contact about it, and is available for \$25 a year (½ the usual cost of these things) from Washington Women's Representative, Capitol Hill, 110 Maryland Ave. N.E., Washington, D.C. 20002.

Marjorie L. Stein, U.S. Postal Service

Since April 1975 I have been employed at U.S. Postal Service Headquarters in Washington, D.C. Until February 1976 my title was Senior Mathematical Statistician, although I have had no formal training in statistics. In government service one quickly learns that official job titles and job descriptions frequently show little correlation with the employee's qualifications or the position's responsibilities.

According to the job description, my duties were to include analysis, design and development of management information systems. Such work involves analysis of a customer's information requirements and conceptualization of large-scale data collection systems to fulfill those requirements. My first project was to analyze the system for allocating transportation costs to classes of mail. Most of the work was "investigative reporting", researching what proved to be a very poorly-documented data collection system and preparing a report on the findings. Other tasks have included "in-house" consulting projects such as formulating a model for estimating total piece handlings at post offices, given incoming volumes and percentage flows between handling points. Tasks such as determining the reliability of estimates might have been easier with a solid background in statistics, but one can learn appropriate techniques as needed. More important skills are the ability to communicate orally and in writing, willingness to learn new topics and ability to work well with others. Specific mathematical background has been less important than the discipline and general training that enable one to recognize, formulate, solve and explain problems in a clear, concise and logical fashion.

To explain how I obtained this position at the Postal Service, let me briefly review my career. In 1972 I received the Ph.D. in Mathematics from Princeton University. My dissertation encompassed the theory underlying algorithmic solutions to linear systems, linear programs and matrix games. Finite mathematics has been my general area of interest, particularly mathematical programming, graph theory and game theory. During a one-year postdoctoral appointment at the Mathematics Research Center in Madison, Wisconsin, I had an opportunity to learn some computer programming and to teach an upper-level course in linear programming theory. In the fall of 1973 I came to Washington, D.C. as a postdoctoral fellow at the National Bureau of Standards. Although I was free to pursue my theoretical interests, it was not difficult to become involved with some of the applied research projects of the Applied Mathematics Division and its Operations Research group. By the time this appointment was renewed for a final year, I had decided that I enjoyed life in the Washington vicinity enough to seek permanent employment in the area.

Job-hunting in Washington can be both frustrating and fun. Interviews are fascinating if one enjoys meeting people and finding out what they do, but seeking the interview can be frustrating. For government positions one is told to file Standard Form 171 with the Civil Service Commission to obtain a rating on the GS (government service) scale of 1 to 18. Experience has taught me that this procedure is necessary but by no means sufficient. For professionals at levels GS-12 and higher, the Commission will no longer give a rating until one has already been employed in federal service. Effectively, then, employment history largely determines grade level. New Ph.D.'s usually enter at level 11 or 12, depending on the agency and its needs.

How does one obtain the initial position? Each agency keeps updated announcements of openings, usually in the personnel office. Sifting through these listings can be tedious and time-consuming. Since closing dates for filing applications are often within a week or two of announcement dates, one is advised to haunt the offices intermittently. Of course this process is difficult, if not impossible, for anyone not already in the vicinity of a federal agency. Even for a government employee this route can be fruitless and frustrating because jobs are often tailored to fit an individual already known to the hiring office. Posting the announcement may be intended as a formality to comply with regulations. It is a rare person who has credential sufficient to overcome that kind of obstacle. Unfair? You bet it is! But that's occasionally how hiring is done.

Since I was employed at the Bureau of Standards--albeit on a temporary fellowship--I was able to find out what agencies had openings, and, equally important, whom to get in touch with on the staffs. It is very helpful to establish direct personal contact with the professional staff at other agencies, and this contact can rarely be accomplished by dealing with personnel offices. I obtained names of appropriate people through my own friends, acquaintances and supervisors and by keeping in touch with people I had met at conferences and seminars. I subsequently telephoned them or sent a brief resume by way of introduction.

Ironically, after much effort and many interviews, I did <u>not</u> obtain my initial position at the Postal Service through Civil Service listings. Instead, I answered an advertisement for operations research analysts that appeared in a newsletter of the Washington Operations Research Council. Within three weeks I was interviewed and offered a position.

Working for the government can be rewarding. It is very satisfying to solve a customer's problem by developing a model from initial formulation to final implementation. It is equally gratifying to know that one has saved time or money through increased efficiency. Occasionally, projects also lead to publishable theorems or applications. Other rewards include good salaries, fringe benefits, and, in some cases, job security.

There are nevertheless some difficulties and drawbacks for the professional. It is not always feasible to attend seminars or conferences unless one is giving a presentation or the topic is germane to a work assignment. For this reason I have felt more professionally isolated at the Postal Service than at any other time. It is also difficult to work on pure research during business hours. On the other hand, one usually has evenings and weekends free.

Mobility is sporadic. In contrast to the cyclical hiring patterns of academic institutions, openings in government may occur at any time. At this moment the Postal Service has a "freeze" on hiring from outside its ranks. Nonetheless, there are openings advertised daily for which present Postal applicants will be considered. For example, a few weeks ago I applied for promotion to an advertised position of Senior OR Analyst in the Mail Classification Research Division, and I am beginning work there in February. This work will involve monitoring contracts for a series of studies to determine an optimal mail classification scheme.

It is difficult to determine how many positions exist requiring backgrounds in mathematics in an agency like the Postal Service. In those executive-level jobs at Postal Headquarters with titles relating to accounting, statistics, operations research and economics, there are presently about twenty women. In the Office of Statistical Programs and Standards, where I was employed until February, one of three Division Managers and one of the five Branch Managers are women. In the Division where I worked there were three women among a staff of 14 professionals of whom 13 hold advanced degrees, four of them doctorates.

My experience at NBS and at the Postal Service has indicated fair treatment of women and honest efforts to hire at professional-technical and middle-management levels. Nevertheless, I should speculate that not many women have yet attained upper management positions in any federal agency.

To conclude, here are a few helpful hints for obtaining and holding government positions and making the most of the opportunities and experiences they afford.

- 1. Having a broad range of experience and skills in applicable areas--be they computing, operations research, statistics or fluid dynamics--is usually more valuable than having one narrow area of profound expertise.
- 2. It helps to express genuine interest in learning new skills and in assuming new responsibilities.
- Communication skills, both oral and written, are indispensable. Many projects culminate in a written report that must be accessible to management or customers who often have limited technical backgrounds.
- Personality and personal contacts are nearly as important as technical expertise. Ability to get along with supervisors, colleagues and people in other departments is essential.

The Women's Bureau of the Labor Department has some useful publications on employment of women. To receive notices of their publications, write to Women's Bureau, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210.

Copies of the pamphlet, "A Guide to Job Hunting, Federal and Private Employment, Washington, D.C.", are available for 25 cents each from the Washington Branch, AAUW, 1307 New Hampshire Ave., N.W., Washington, D.C. 20036.

At the January San Antonio meeting, it was decided to publish the newsletter every second month. Thus this issue is the combined March-April issue. This does not effect the functioning of the job register; if you are registered with it, you will still get job announcements as soon as we can get them to you. See the note by Judy Green below for a brief description of the register's functioning.

The Committee agreed that Mary Gray will handle the discrimination cases brought before AWM. (See Report From the President in this issue for a discussion about this.)

Due to other commitments, Alice Schafer has resigned as AWM treasurer. She continues on the Executive Committee. Ann Stehney, also of Wellesley College, has agreed to act as treasurer until the next election which will be held in the spring of 1977.

REPORT ON THE MEETING OF THE AMERICAN MATHEMATICAL SOCIETY COUNCIL

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The Council met on 21 January in San Antonio. It postponed action on the matter of censure of institutions until the 11 April meeting at the Biltmore Hotel in New York. One censure case involves the issue of discrimination against women. The Committee on the Emergency Employment Situation in Mathematics proposed the following resolution, which was passed by the Council:

The Society should urge research oriented departments to offer unemployed mathematicians, and mathematicians in jobs with no research facilities, opportunities to remain associated with the research community. This can be done by offering such mathematicians nominal, unpaid research appointments which would provide office space (when feasible) and access to the library as well as an opportunity to participate in seminars and, in general, interact with members of the department.

The President agreed to write an appropriate letter to research minded universities and to the NOTICES.

The Council passed a motion not to publish the article by Hoang Xuan Sinh, titled "The Troubles of a Woman Mathematician," in the NOTICES.

It was agreed that there should be one Colloquium Lecturer per summer or annual meeting and that there should be no conflict on the program with any of the lectures in a set of Colloquium Lecturers. It was noted that the Committee should impress on the speaker the educational aspect of the lectures for generally well informed mathematicians who are not specialists in the speaker's field.

In accepting the report of the Joint AMS-MAA Committee on Women in Mathematics, the Council approved joint sponsorship by the Society for Industrial and Applied Mathematics.

Council member Karl Norton offered a set of motions concerning the work of the Committee on Academic Freedom, Tenure, and Employment Security. Six of them were referred to an ad hoc committee to write rules of operation for CAFTES. The seventh directed the Committee on Dismissed Mathematicians to report on its activities to the April Council meeting.

Several matters concerning mathematicians in other countries came before the Council. The Council recommended to the Business Meeting of 23 January that they consider the following resolutions (which were later approved by the Business Meeting): This Business Meeting of the American Mathematical Society, concerned by reports that the esteemed mathematician Jose Luis Massera is in prison and has been held for a considerable period without trial, calls for his release and the protection of his human rights. This Business Meeting of the AMS calls for the release from prison of Professor of Mathematics L.A. Ladyzenskii of the University of Riga.

The Council passed a resolution requesting that a letter of inquiry be sent to the Ambassador from Spain concerning the status and reason for expulsion from Spain of Amin Mojtar, Professor of Algebra, Topology, and Geometry at the University of Malaga. The following resolution was also passed:

The NY Times (17 August 1975, p. 29B) reported an official announcement by Admiral Arturo Troncoso, Minister of Education of Chile that (i) 44 professors, employees and students of the University of Chile had been arrested for "Marxist activities" and turned over to military intelligence agents for

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interrogation, (ii) a few of these 44 were likely to be released shortly as lacking serious involvement in such activities, but (iii) all, including any released, would be dismissed from the University, if employed there, and expelled if students.

Among those arrested, we heard subsequently, was Professor Alicia Alcayaga of the mathematics department. No later information concerning her has reached us.

The Council of the American Mathematical Society deplores these arrests and dismissals. It calls for the release of those arrested and the restoration of those dismissed or expelled. It requests information concerning the present fate of Professor Alicia Alcayaga.

The Council abolished reciprocity agreements with the mathematical societies of other countries and instituted a new category of membership--"foreign member."

An Editorial Board was established for the NOTICES, to be chosen by the Council with the help of the Nominating Committee and to be broadly representative of different viewpoints within the Society on matters involved in NOTICES policy.

Professor Judy Green inquired about the policy of review by the Executive Director of copy to be mailed when Society mailing lists are rented. Without the formality of a motion, the Executive Director was urged to continue to follow the policy of review.

The following people were recently elected to AMS offices:

Vice President: Mary Gray, Louis Nirenberg

Council: Hugo Rossi, Lee Rubel, Barry Simon, Guido Weiss

Nominating Committee: Elected: Phyllis J. Cassidy, Edward B. Curtis, Chandler Davis, R.O. Wells, Jr. Appointed: Armand Borel, Kevin McCrimmon, David A. Sanchez, Dorothy M. Stone

Of the above, Gray, Simon, Cassidy, Davis, Wells, and Stone are AWM members. Since the nominating committee will be an important voice in shaping the future of the AMS, the large number of AWM members on it is gratifying.

We note that Lipman Bers, AMS president, has requested volunteers for AMS committees. There is a small group of Canonical Women that get named to committees whenever Bers, who is quite conscientious about these things, wants to appoint a woman. Some of these people are getting tired and would appreciate some help in spreading the work around. So if you're an AMS member and a woman you might want to volunteer.

JOB REGISTER (by Judy Green)

This fall the AWM job register changed its method of operation. Instead of contacting women individually when we learned of a specific job opening we now send out, once a month, the announcements which will eventually appear in the newsletter. In order to receive these listings send several stamped self-addressed envelopes to:

> AWM Job Register Department of Mathematics Wellesley College Wellesley, MA 02181

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There are currently about 20 women receiving these announcements. This represents a drop from previous years' users of the job registry. Since it is not likely that there are fewer women on the job market this year, I am asking for comments on the desirability of this change both from users (past and present) and nonusers of the register. I also think it would be helpful to the writers of announcements to know how the readers of the job notices decide whether or not to apply for a particular position. Please address your comments on the above and any questions about the register to:

A nice part of editing this newsletter is that I get to read stuff that other women send us which might be of interest to our readers. For this issue nearly all of this material was on women, math, and education, and two trends were so clearly apparent that it seemed appropriate to editorialize a bit in presenting it.

There is both good news and bad news. The good news is that the U.S. is bursting with special programs either explicitly designed to help women overcome bad early conditioning towards mathematics, or designed to help everybody, and thus women too. Aside from those reported on in previous issues, we have:

Ruth Afflack of California State University at Long Beach with a four-part workshop held in January. This program was designed to help adult women overcome math anxiety, and as many of these programs do, it relied on games, labs, and other non-standard methods of teaching people to connect with their own innate mathematical ability. (Parenthetically, I am personally quite excited by the plethora of such techniques invented spontaneously across the country.) The program was sponsored by the CSLB departments of math and of women's studies, and was implemented through the CSLB continuing education program.

A spring conference at California State University at Fresno. Funded by a Chancellor's grant, this conference for teachers (what level? our information doesn't say) is designed to help remove some of the conditions that foster math anxiety among women students before they enter college. It will be held sometime this spring (again, our information doesn't say exactly when). If you're near Fresno and are interested, contact the math department there; if you attend, let us know what went on.

Wesleyan University's Math Clinic. Aside from classes in remedial mathematics and individual tutoring, this clinic has the unusual component of a trained psychologist (her training is in learning disabilities) available for individual therapy. Such therapy includes exploration of the student's attitudes towards mathematics, and is apparently quite popular. Its particular suitability to the problems of women students is apparent.

A library on women in math and science, together with a computer-compiled listing of publications on mathematics. This is at Berkeley's Lawrence Hall of Science, which has been working on bettering the mathematical education of women for several years.

A package on "Women in Science" published by the American Association of Physics Teachers and produced by Dinah L. Moche. While this material concentrates on women physicists, it is clearly relevant to raising children's and teenagers' consciousness about the ability of women to do mathematically oriented things. While presumably there is a primary source for obtaining the package (written, taped, and visual materials) the only place we know of to get it is the University of Cincinnati's office of women's studies. This group also publishes the highly informative Women's Studies Forum, which is how we know about the AAPT package and the Berkeley program. A public file on late careers for women at Marshall University. Sponsored by the Education Committee of the American Association of University Women, they are now collecting material for the file, and are interested on information about women entering the labor market after seven or more years absence from professional work. You can send such information to Beth E. Smith, 1122 13th Street, Apt. D, Huntington, West Virginia 25701. Again, while not explicitly directed towards mathematics, its relevance to our problems is clear.

Now for the bad news: things may be improving for the students, but they're getting worse for the faculty, at least in higher education (any of our readers have statistics on high schools and elementary schools?). The U.S. Office of Education reported that while the percentage of women faculty members in colleges and universities remained the same between 1974 and 1975, in 1975 there were fewer tenure track positions held by women; that while women's salaries increased by 5.8 per cent, men's salaries increased by 6.3 per cent; that 60% of the men had tenure, and only 42% of the women; that on the average a woman faculty member at a public university or college earned about \$2,800 less, and at a private institution about \$3,700 less then her male colleagues.

For a particularly blatant example of these trends, consider the University of California at Berkeley. (The reason we pick on Berkeley so much, by the way, is simply because we have information about it. It would be surprising if the situation there were unusual.) In 1974 Berkeley adopted its affirmative action plan, to be put into effect beginning in 1975. In 1974, 25% of the new faculty at Berkeley were women. In 1975, after the adoption of the plan, the percentage of new Berkeley faculty who happened to be women had dropped by over 9%, to 15.8%. Minority hiring had also dropped, although a shade less shockingly: from 18.2% of the new 1974 faculty to only 14% of the new 1975 faculty. So much for affirmative action plans.

What can be done about this? Some universities, such as Berkeley, have review committees from outside the institution investigating their math departments regularly. If your department is about to have such a review, document your facts and submit them to the review committee; also send them to us and we'll submit a letter backing you up. This is what was done at Berkeley. Warning: the members of these committees are not exactly chosen for their feminist consciousness, so don't expect immediate results.

Some states, such as Massachusetts, have special offices, committees, whatever, on women; these groups, and also state and federal legislatures hold hearings on equal employment opportunities. You can offer to appear as a witness at such hearings (such an offer should be accompanied by a written summary of the facts that would be presented; even if you never appear, the information is on file in an appropriate place). Even if such a hearing is not being held, information can always be sent to the relevant state office or federal agency. Naturally, no immediate results are to be expected, even if the group you're contacting is entirely on your side.

So why bother at all? Simply because there is too much misinformation floating around. The popular opinion is that equal rights for women is a reality, that once an affirmative action program is signed all problems are solved, and that it is the white male who needs protection now as an endangered species in academia. Alot of people believe these myths; even people with some power over hiring, salaries and tenure - people who ought to know better - believe these myths. It is essential that the facts be made public so no-one can hide behind misinformation; it is important that the state and federal government be reminded again and again that the law is being broken and, where not broken, often artlessly dodged by people unaware that they are dodging it.

Judy Roitman

JOBS

The vacancies listed below appear in alphabetical order in an alphabetical listing of states, followed by Canadian listings.

Cal. State Poly. U., Chemistry, (1) Lecturer, Organic Chemistry, strongly con-sidered for permanent position. (2) Lecturer, Bio-Organic Chemistry, possibility of permanent position. (3) Lecturer, specialization open, one-year replacement position. \$12,732 - \$14,736 for 9 mos. Doctorate or near Doctorate required. Send resume and arrange for three letters of recommendation to be sent to: Dr. Charles E. Bowen, Chairman, Search Committee, Dept. of Chemistry, Cal. State Polytechnic U., Pomona, CA 91768. Deadline 4-1-76. Cal. State Univ., Sacramento. Dean, School of Education. Requirements: Earned doctorate or equiv. in Education or closely related field, background & exp. for appointment at prof. rank in one of depts,, successful teaching & administrative experience in higher education. Salary: \$27,492 - \$33,420. Deadline 3-15-76. Contact: E. James Archer, Vice President for Academic Affairs, Cal. State Univ., 6000 J Street, Sacramento, CA 95819. California State University, Sacramento, Dean of Graduate Studies. Responsible for the overall coordination of graduate programs & sponsored faculty research projects within the University. \$27,492 - \$33,420 12 mos. Deadline: 3-22-76. Application and credentials to: E. James Archer, Vice President for Academic Affairs, California State Univ.. Sacramento, 6000 J Street, Sacramento, CA 9589 Cal. State Univ., Sacramento, Dean of Academic Resource Planning. Requirements: Advanced degree, eligibility for teaching appointment, university administrative experience. Salary: \$27,492 - \$33,420. Deadline 3-15-76. Contact: E. James Archer, Vice President for Academic Affairs, California State University, Sacramento, 6000 J Street, Sacramento, CA 95819. Menlo College, Dept. of Mathematics. Requirements: Master's degree in math. or statistics with broad knowledge of applications and interest in economics, business or biological science. \$10,200 to \$12,400. Deadline 4-30-76. Send application and resume: James P. Conlan, Chairman, Mathematics Department, Menlo College, Menlo Park, CA 94025. Monterey Peninsula College, Assistant Dean of Student Personnel-Student Activities. Requirements: master's degree in a behavioral science, preferably student personnel services; hold or meet qualifications for a Cal. community college supervisor credential. Salary 24,902 to 25,985 plus \$100/month car allowance for 12 mo. contract. Starting: 7-1-76. Send MPC District application form, vitae, and either a complete set of unofficial transcript copies or a listing of graduate courses to Jack D. Bessire, Dean of Student Personnel, Monterey Peninsula College, 980 Fremont, Monterey, CA 93940 postmarked no later than 3-15-76. Teledyne Systems Company. Application Engineer. Requirements: bacnelor's degree in Engineering or Physics. Duties: make service & training calls, sales presentations and to participate in engineering design tasks to improve our existing navigation products and to develop new products. Send resumes to: J. William Oldenkamp, Director, Industrial Relations and Equal Employment Opportunity, Teledyne Systems Company, 19601 Nordhoff St., Northridge, CA 91324. U. of Cal., Davis. Possible opening Visiting Professor in Statistics 1976-77 academic year. Requirements: interest & competence in teaching, research in applied or theoretical area of statistics, and statistical consulting w/ researchers in other disciplines. Deadline April 9. Contact: Professor David Mead, Chairman, Dept. of Math. University of California, Davis, CA 95616. Energy Research & Development Administration, recruiting individuals with a technical background to help in implementing the nation's Energy Program. Opportunities for experienced & recent college graduates w/backgrounds in: Engineering (civil, chemical, electrical, nuclear, mechanical & petroleum), Computer Science/Statistics, Operational Safety, Chemistry, and Geology. Send SF-171 form or resume to: Coordinator of Recruitment, Energy Research & Development Administration, Washington. D.C. 20545 Attention: Donel Johnson. National Science Foundation, Roger Doyon, Head, General Programs Section, has two intern positions for next year. (1) generalist position for all his international programs (2) for international science studies. Social scientist particularly preferred in latter. Should be mid career at university & willing to

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return. NSF picks up 95 per cent of costs, university pays 5 per cent. Contact Roger Doyon, General Programs Section, NSF, Washington DC 20550.

<u>U. of Delaware.</u> vacancies (1) 2 Asst. Prof available 9-76. Classical Applied Math, Numerical Analysis, Optimization, Random Processes, and Discrete Applied Math. Ph.D. & active research interest required. Higher rank possible w/exceptional qualifications. (2) Several one-yr. visiting positions in various areas of research available 9-76. Contact: I. Stakgold, Chairman, Dept. of Math., Univ. of Delaware, Newark, DE 19711.

<u>U. of Delaware.</u> College of Marine Studies. Assistant to the Dean for Accounting, Budgetary Planning & Economic Analysis. Requirements: equiv. of an MBA w/coursework in accounting, engineering, economics, etc., and 4-7 yrs exp. or a bachelors degree with additional exp. Exp. in cost accounting, economic analysis and comp. bus. systems essential. Start immediately. Contact: Joyce Fuller, U. of Delaware, Marine Studies, Newark, DE 19711 (telephone 645-4224.) U. of Delaware. Assist. to the Director, Budget Control Office. Requirements: Bachelors degree in accounting, bus. admin., finance or economics plus 3-6 yrs exp. in accounting or budget admin., familiarity w/comp. bases systems. Contact Dave Paca, Director, Office of Budget Control, U. of Delaware, Newark, DE 19711 (telephone 738-1234.)

<u>Illinois Institute of Technology</u>, Dean of the Lewis College of Science and Letters. Qualifications: national recognition beyond that required to merit full professorship in one of academic disciplines represented in the College of Science and Letters. Send resume and names of three references to: Professor Harold Weinstock, Chairman, Search Committee for Dean of the Lewis College, Department of Physics, Illinois Institute of Technology, Chicago, IL 60616.

Illinois Institute of Technology, Dept. of Mathematics, Asst. Professor, start 9-76. Requirements: Ph.D. and publications beyond the thesis in the area of Differential Equations, teaching experience at both undergraduate and graduate levels; background in Numerical Analysis desirable. Send vita & letters of reference to: Professor L. A. Kokoris, Dept. of Mathematics, Illinois Institute of Technology, Chicago, IL 60616.

U. of Illinois, Dept. of Math., three anticipated openings (1) Prof. or Assoc. Prof. beginning 8/21/76 or 77. Outstanding research accomplishments required. Salary min. \$18,000. (2) Assist. Prof. beginning 8/21/76. Outstanding research accomplishments required. Candidates any field of math. Salary min. \$15,000. (3) several visiting lectureships beginning 8/21/76. Ph.D. in math. required. Temp. positions, 2 yrs. max. Salary \$12,000. Contact Paul T. Bateman, Head, Department of Mathematics, Urbana, IL 61801.

Indiana University Southeast, Dept. of Math, one, and possibly two, tenure track positions starting August 1976. Assistant Professor. Salary 11,500 -12,000 10 mos. Summer teaching possibility. Ph.D. required. One position must have strong background in probability & statistics and both able to teach computer programming. Contact Professor W. Brian Hill, Dept. of Math, Indiana Univ. Southeast, P. O. Box 679, New Albany. IN 47150.

Kansas S. U. One yr. visiting Assist Prof. Salary \$9500 or more. 6-8 hrs/wk teaching load. Specialty: Group Theory. Deadline 4-1-76. Contact: John E. Maxfield, Head, Dept. of Mathematics, Kansas State University, Manhattan, KS 66506.

66506. <u>U. of Louisville</u>. Asst. Prof. Electrical Eng. with specialization in either a) Power Systems or b) Communications Theory. Ph.D required. Contact: Dr. Darrel L. Chenoweth, Chairman, Search Committee, Electrical Eng. Dept., Univ. of Louisville, Louisville, KY 40208.

U. of Louisville. Associate Professor of Education. Requirements: earned doctorate or equiv. exp., elementary and/or secondary teaching exp., college/university teaching exp., experience in proposal writing & funding including NSF programs, experience in development of grad. science education programs for teachers.

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experience in research & publication, and local, state or national leadership in science education. Start 8-1-76. Deadline 3-15-76. Send transcript, three references and current academic vita to: Dr. Jack Morgan, School of Education, Univ. of Louisville. Louisville, KY 40208.

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Xavier Univ. of Louisiana, 1976-1977 Biomedical modeling, 12-month appointment. Contact: Johnette Hassell, Xavier U. of La., 7325 Palmetto, New Orleans, LA 70125.

Goucher College, Dean of Students. Previous experience required. Contact: Rhoda M. Dorsey, President, Goucher College, Towson, Baltimore, MD 21204.

Boston College, Dept. of Mathematics, Ph.D. preferably in fields of applications of mathematics, other applicants will be considered. Contact: G. G. Bilodeau, Chairman, Department of Mathematics, Boston College, Chestnut Hill, MA 02167.

GTE Sylvania, Inc. has a number of openings such as Adv. Res/Dev. Eng., Radio Communication System Eng., Sr. Eng. software, Eng. Spec., etc. For further information contact: James V. Gerraughty, Employment Representative, GTE Sylvania, Inc. Communication Systems Div., 189 "B" Street, Needham, MA 02194. Massachusetts Institute of Technology. 2 Post. Docs. Pn.D. in Comp. Science req. Contact Eva I. Kampits, Assist to Director., Massachusetts Institute of Technology, Cambridge, MA 02139.

Polyvinyl Chemical Industries. (1) Director of Manufacturing. Requirements: E.S. or B.Ch.E. and a proven record of manufacturing & administrative exp. in the chemical and/or resin fields. (2) Research Specialist. Planning & development of polymer compositions particularly for leather area w/emphasis on emulsion polymerization. Requirements: BS or BA w/major in chemistry, 2-7 years exp., and interest in and aptitude for lao. exp. work. Send resumes to H. J. Thoma, Personnel Manager, Polyvinyl Chemical Industries, 730 Main St., Wilmington, MA 01887.

<u>Tufts Univ.</u> Dept. of Math. Asst. prof. starting 9-76. Dynamical systems preferred but geometric topology considered. Send curriculum vitae, reprints, and three letters of recommendation by April 15, 1976 to George F. Leger, Chairman, Dept. of Math., Tufts Univ., Medford, MA 02155.

Univ. of Massachusetts Dept. of Computer and Information Science anticipated openings for two Assist. Professors beginning 9-76. One in computing systems area.Recruiting interest lies in large data bases and data structures or operating systems or compiler design but other spec. will be considered. Other opening in area of artificial intelligence w/concentration in natural language processing, representation of knowledge, AI languages or problem solving. Ph.D. or equivalent required for either. Contact: Caxton C. Foster, Chairman COINS Personnel Committee, COINS Dept., Graduate Research Center, Univ. of Mass., Amherst, MA 01002.

<u>Central Michigan Univ.</u> Dept. of Mathematics. Assist. Frof. for either (a) someone in mathematics education with training in teaching of low achieving elementary and secondary students and having special interest in the middle school or (b) a mathematician with background and training in an applied area such as quantitative methods in business and administration, operations res., modeling theory, or applied statistics. Doctorate or other strong qualifications required. Contact: Thomas J. Miles, Chairman, Department of Mathematics, Central Michigan Univ., Mt. Pleasant, MI 48859.

Central Michigan Univ., Mt. Pleasant, MI 48859. <u>Central Michigan Univ</u>. Dept. of Mathematics. Two Computer Science positions-one at assoc. or full professor rank and one at assist. prof. rank. Ph.D. (or near) required. Top priority is for a person in software systems. CMU offers a major, minor, and masters degree in comp. sci. Deadline March 15. Contact: Thomas J. Miles, Chairman, Department of Mathematics, Central Michigan Univ., Mt. Pleasant, MI 48859.

Michigan Technological University. Several positions in the Dept. of Electrical Engineering, College of Engineering may be available 9-76. Candidates who are

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interested contact Richard F. Schwartz, professor & nead, Dept. of Electrical Engineering, Michigan Technological Univ., Houghton, MI 49931. Augsburg College two possible full-time positions, start 9-76. (1) Math and Computer Science. (2) Math., M.A. or Ph.D. Experience preferred. Send credentials to Beverly Durkee, Acting Chairman, Dept. of Mathematics, Augsburg College, 731 - 21st Avenue South, Minneapolis, MN 55454. Carleton College, Instructor or Assist. Prof., starting 9-76. Salary 10.5 to 12. TIAA/CREF, Major Medical, Group Life and modest hospitalization plan. Contact: S. Schuster, Chairman, Carleton College, Northfield, MN 55057. St. Cloud State Univ., Dean, Liberal Arts & Sciences. Requirements: earned doctorate in Liberal Arts & Sciences, significant teaching & administrative experience, evidence of scholarly activity. Deadline: Letters of application 4-2-76, completed credentials 4-16-76. Start 7-1-76. Contact Dr. J. Gottshall, Chairperson, Dean of Liberal Arts & Science Search Committee, St. Cloud State University, St. Cloud, MN 56301. 3 to 5 letters of recommendations required. Washington Univ., Asst. Director, Systems & Data Processing Programs. Educational and industrial exp. in data processing with relevant academic credentials desirable. Send resume with references to: Associate Director, Systems and Data Processing Programs, Box 1152, Washington Univ., Skinker & Lindell Blvds, St. Louis, MO 63130. Rutgers Univ., Dept. Math., Applied Mathematician, level of full professor. Contact: Prof. Daniel Gorenstein, Chairman, Dept. of Math. at New Brunswick, Rutgers Univ., The State Univ. of New Jersey. New Brunswick, NJ 08903. State of New Jersey, Dept. of Higher Education three positions: (1) Assoc. Director, Community College Program. Requirements: comprehensive planning and/or institutional res. exp. either campus or state coordinating level. three yrs. campus based admin. exp., terminal degree or equiv. Salary low twenties. (2) Assist. Director, Planning & Research. Responsible for development of state funding formulas, longitudinal studies. Master's degree or its equiv. preferred in social sciences. Comp. programing & applications desirable. Five yrs. related exp. Salary upper teens. (3) Budget & Fiscal Analyst. Responsibilities: budget & policy analysis and student assistance programs. MPA, MBA or equiv. desirable in addition to several yrs. exp. in public budgeting. Salary low to mid teens. Send resume and salary history to Robert W. Miller, Supervisor, Personnel Services, State of New Jersey, Dept. of Higher Education, 225 West State St., P. O. Box 1293, Trenton, NJ 08625. Columbia U. Asst. Prof. Oper. Res. & Eng. Math. Doctorate in Oper. Res. or Applied Math. required. Application Deadline 4-15-76. Send resume and references to: Professor Morton Klein, 310 S. W. Mudd, Columbia U., New York, NY 10027. Elmira College, Theoretical Mathematics, opening 9-76. Send resume & three letters of recommendation or full credentials to: Dr. David G. Ruffer, Provost, Elmira College, Elmira, NY 14901. Fordham Univ. Math, Asst. Prof. Contact: Dr. S. Mourad, Div. of Sciences & Math, Fordham Univ. at Lincoln Center Campus, 60 & Columbus Ave., New York, NY 10023. St. Lawrence Univ. Faculty Position, Computer Science, 9-76. Requirements: Ph.D, preferably in mathematics, with strong background& interest in comp. science. Send resume & references by 3-31-76 to Francis D. Parker, Chairman, Dept. of Mathematics, St. Lawrence Univ., Canton, NY 13617. S.U.N.Y., Buffalo. Possible openings for 1976-77. Visiting Professor in Algebra (Category Theory) or Logic, one year term; Associate Professor in pure mathematics preferably algebraic-differential topology; Assistant Professor in pure mathematics All positions require demonstrated research achievement at appropriate level. State budget freeze prevents current hiring; but applications are invited against possible lifting of the freeze. Contact: Dr. Richard E. Vesley, Acting Chairman Dept. of Math., SUNY/Buffalo, 4246 Ridge Lea Rd., Amherst, NY 14226.

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Ph.D. required. Background in radio, optical or theoretical astrophysics (evidenced by publications in refereed journals). Send vita and four references to: Dr. Elliott Moore, Search Committee, Physics Dept., New Mexico Institute of Mining & Technology, Socorro, NM 87801. Denison University, Assist. Prof. in Computer Science. Requirements for Ph.D. completed or nearly completed. Ability to teach half of following courses: Introductory Comp. Science, Modeling and Simulation, Information Systems Analysis, Computer Organization and Systems Programming. File Organization and Data Structures, Programming Languages, Systems Design, Software Design. Contact: Dr. Daniel D. Bonar, Chairman, Dept. of Mathematical Sciences, Denison Univ., Granville, OH 43023. Start 9-76. Ohio Northern University. Dept. of Mathematics, Assist. Professor. Ph.D. in comp. science or closely related field. Start 9-76. Contact: J. T. McLean, Chairman, Dept. of Mathematics, Getty College of Liberal Arts, Ohio Northern University, Ada, OH 45810. University of Cincinnati, Dept. of Engineering Analysis, Headship. Requirements: demonstrated ability in leadership, teaching and sponsored research. Submit vita and names of three referees to: Dr. James L. Klemm, Dept. of Engineering Analysis, Univ. of Cincinnati, Cincinnati. OH 45221. Wittenberg Univ., Dept. of Math. two full-time openings (one continuing, one temporary), Assist. Prof. level. Requirements: Ph.D. by Sept. 1976. Freference given applicants who have background in applied math. along with comp. science experience. Additional Information contact: Eric L. Wilson. Chairman, Dept. of Math., Wittenberg Univ., Springfield, OH 45501. Slippery Rock State College. One year sabbatical replacement Mathematics teaching computer science and mathematics. August 1970 to May 1977. Ph.d. and three yrs. teaching exp. required. Send application, transcripts, three letters of recommendation to Dr. Howard H. Campaigne, Chairman, Dept of Math. Slippery Rock State College, Slippery Rock, PA 16057. Deadline 4-15-76. University of Pittsburgh at Johnstown, Mathematics Dept., Instructor or Asst. Professor. Limited opportunities for summer teaching. Requirements: doctorate strong background in mathematical or applied statistics and computer science. college teaching exp. Start 9-76. Salary range \$9,000-\$13,000 Instructor and \$11,000-\$16,300 Assist. Prof. Send application and resume by 3-31-76 to Dr. John D. Wilson, Chairperson, Mathematics Search Committee, Univ. of Pittsburgh at Johnstown, Johnstown, PA 15904. U. of Rhode Island. Applied Math. or Applicable Analysis. Anticipated faculty position 9-76 rank of Assoc. Prof. Ph.D. required. Contact: Dr. Norman J. Finizio, Acting Chairman, Dept. of Math., Univ. of Rhode Island, Kingston, RI 02881. Lamar Univ. Assist. Professor, Mechanical Engineering. Start 9-76. Requirements: Master's Degree in Engineering with a minimum of 15 years' industrial experience in related field, including three years' varied drafting exp., qualified and willing to pursue Doctor of Engineering Degree, registered professional engineer w/working knowledge of Fortran IV for comp. applications. Obtain applications from: Dr. Otto G. Brown, Professor and Head Mechanical Engineering Dept., P. O. Box 10028, Lamar Univ. Station, Beaumont, TX 77710. University of Washington, Center for Quantitative Science in Forestry, Fisheries & Wildlife, statistician w/biological training preferably w/strong interests in quantitative ecology. Involves teaching & research. Research area is that of modeling impact or human activities on ecosystems. Preferred candidate minor in ecology & major in mathematical statistics. Send vita & three letters of reference to Dr. Benjamin A. Jayne, Director, Center for Quantitative Science in Forestry, Fisheries & Wildlife, University of Washington, Seattle, WA 98195.

University of Washington, Computer Science (joint position with Arts & Sciences) Assistant or Associate Professor. Required: Ph.D. or equivalent experience

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New Mexico Tech, Physics Dept., Full or Part-time for an Astrophysicist,

in Comp. Sci. or closely related discipline. Field preference for hardware, artificial intelligence, data base, or queuing theory; field secondard to capability. Contact Jerre D. Noe, Chairman, Dept. of Comp. Sci., FR-35, Univ. of Washington, Seattle, WA 98195. Deadline 3-15-76. Washington State U. Assist. Professor, mathematical statistics, start 9-76. Preference given to applicants w/theoretical background in multivariate analysis, linear & nonlinear models or stochastic processes and w/research interests in genetics or some area in the life sciences. Women & minority group members encouraged to apply and identify themselves. Submit vitae, transcripts, and three references to Calvin T. Long, Chairman, Dept. of Pure & Applied Math., Washington State Univ., Pullman, WA 99163. Univ. of Wisconsin-Eau Claire, Dept. Mathematics, one-year positions. Doctorate preferred, ability to teach math courses for pusiness & social sciences or elementary teachers. Send vita & three references to Dr. Lawrence Wahlstrom, Chairman, Dept. of Math., HHH 504, Univ. of Wisconsin-Eau Claire, Eau Claire, WI 54701. Deadline 4-15-76. ADVERTISEMENT: A list of nearly 100 periodicals that progressive scientists should know about is available free from PROGRESSIVE TECHNOLOGY; P.O. Box 20049, Tallahassee, FL 32304. The fee for each regular advertisement to appear in the Newsletter is \$5 per issue. With our low dues structure and the high cost of publication, this is the minimum fee we can charge in order to break even. On the other hand, if a college, university or organization cannot afford the fee, then we will publish the advertisement without charge. Advertisements to appear in the Newsletter should be sent to: AWM Newsletter c/o Department of Mathematics Wellesley College Wellesley, MA 02181

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Sep	tOct. Newsletter	copy b	v September 15
Nov	-Dec. Newsletter	copy by	y November 15

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NEW YORK AREA ANNOUNCEMENT:	
Barbara Keyfitz of Columbia University is o	organizing an AWM meeting on Tuesday, April 13
from 5:15 to 4:15 p.m. during the New York AMS n	neeting, room to be announced at the AMS
meeting. If you want to nelp or want more infor	mation, you can call her at her office,
212-280-5097, or her home, 212-850-4841.	
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As we went to press we learned that Jean Taylor of Rutgers University and Linda Rothschild of Columbia University were awarded Sloan Fellowships this year. Congratulations!

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Mar.-Apr. 1976