ASSOCIATION FOR WOMEN IN MATHEMATICS
NEWSLETTER

Volume 7, Number 2

AWM MEETING IN ST. LOUIS
by Lenore Blum and Judy Roitman

The annual winter meeting of the AWM was held during the joint mathematical meetings at the Chase-Park Plaza and Bel-Air hotels in St. Louis, January 27-31, 1977.

Panel discussion

Saturday, January 29, at 4:30 p.m. a panel was held on the topic: "Choosing our lives." Marian Pour-El, originally scheduled to speak, was unable to attend since she was chairing a mathematical session. She was replaced by Judy Green, who spoke about her own two-city marriage. Elizabeth Berman then spoke on surviving after losing a job, and Judy Roitman, who chaired the panel, spoke on surviving while looking for a job. The last twenty minutes were opened to audience participation. The response was warm, with some good practical suggestions from the audience. We have the meeting on tape, and the talks will be appearing in future newsletters.

Open executive committee meeting

Following the panel, an open executive committee meeting was held. The AWM proposal was discussed (extracted in this issue of the newsletter). Suggestions for further proposals were made. The most common suggestion was for a legal component - if anyone knows enough law to write one, please let us know. It was pointed out that the state in which the meeting was being held - Missouri - had not yet ratified the Equal Rights Amendment to the federal constitution. Patricia Kenschaft of Montclair State College drafted the following resolution which was unanimously approved and was distributed the next day to the news media:

"The Association for Women in Mathematics has voted unanimously to urge the remaining state legislatures to ratify the Equal Rights Amendment. Members of AWM from many states and all parts of the country met at an open executive committee meeting today, January 29, 1977 in St. Louis, in conjunction with the annual national meetings of the American Mathematical Society and the Mathematical Association of America. The AWM further hopes that its presence in Missouri will encourage the Missouri legislature to ratify the ERA as soon as possible."

AWM party

Saturday night there was a party.

More history

Sunday, January 30, at noon, the general AWM meeting was held on the subject of British women mathematicians, chaired by Lenore Blum. Speakers were Teri Perl of Stanford University, on the Women's Diary, a recreational math journal popular in England between 1700 and 1850; and Sylvia Wiegand, of the University of Nebraska, who spoke about her grandmother, Grace Chisolm Young. These talks will appear in future newsletters.

AWM table and a protest

As usual, there was an AWM table, to be a meeting place for women and their friends, and a place for both new and old members to pay their dues. It was successful on both counts. Some of our members noticed a particularly sexist ad used by a calculator company at the meetings, and the AWM table became a rallying place to communicate this information and encourage individuals to protest the ad. The company claims it will change its promotional material this month.

Final note

Is it only an impression or is it true that there were fewer women at the St. Louis meeting than at previous math meetings?

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SONYA KOWALESKAYA - HER LIFE AND WORK
by Linda Keen

(Ed. note: Linda Keen, currently at CUNY's Lehman College and Graduate Center, received her degree from NYU - Courant Institute, has held visiting positions at Berkeley and Brown, and has spent a year at IAS.)

Sonya Kowaleskaya was born in Russia in 1850. Her father was an artillery officer in the Russian army. When she was eight, her father retired and the family lived on his estate, Palibiuo, in the province of Vitebsk. She spent her childhood and teenage years living on this estate with her beautiful older sister Anyuta and younger brother Fedya. She felt she was clumsy, unattractive, and the least loved of the three, a feeling strongly re-enforced by her nurse "nyanya". These early emotions clearly played a major role in influencing her reactions to her work and her relationships to people in her adult life.

During her teens she began to develop various intellectual interests, but the idea of a learned woman was very abhorrent to her father. When he was told she was particularly good in algebra, her algebra book was taken away. However she was able to acquire the book and continued to read it secretly at night. At fourteen, a neighbor gave her a copy of his new physics textbook which contained a section on optics in which trigonometric formulas were used. She asked her tutor to explain the sine function to her. He was not up to this in his own studies and told her he didn't know. She tried to figure out for herself what the concept was and decided to substitute the length of a chord for the sine. Since, for small angles, this is a very good approximation, she was able to understand the text.

Both she and her older sister were very concerned with obtaining university educations for themselves but felt it was impossible. In fact, at that time in Russia, it was essentially impossible. The universities were completely closed to women and the only way a woman could study was to go abroad. Anyuta, whose interests were more literary than Sonya's, had become acquainted, through the son of a local priest, with the existence of a group of young intellectual radicals in Petersburg. He brought back to her stories of their communal life, the books they read, and he told her of their ideas. These stories further firmed the resolve of the girls to break away from their provincial life and to go abroad to study. On a visit to Petersburg, Anyuta heard of a way to do this. They would try to arrange, with the help of some intellectual friends, "fictitious marriages", that is, marriages in name only which, however, would free them from the legal ties to their parents.

In 1868, Anyuta was introduced to a young geology student, Vladimir Kowalesky, who was willing to marry her. There were several meetings with Kowalesky to arrange matters and to try to find husbands for Sonya and another friend. Sonya attended one of these and Kowalesky was so taken with her that he announced that while he would be willing to enter into a fictitious marraige it would be only with Sonya and not with her older sister. They were married in 1868 and spent the next few months in Petersburg preparing for their trip and searching for a husband for Anyuta. The search was unsuccessful and in the spring of 1869 the three of them set off for Germany with the young couple acting as chaperone for the unmarried older sister.

When they arrived in Heidelberg, Sonya was shocked to find that it was not easy for women to study at the university and that, in fact, they were barred from matriculating. She made a tremendous effort and finally received permission to audit lectures without matriculating. The next three semesters were among the happiest of her life. She worked hard but didn't drive herself in the way she did later. She studied chemistry with Bunsen, physics with Helmholtz, and mathematics with Kronecker. Anyuta went off to Paris. A Russian woman friend, Yulya Lermontova, came to live with her and Vladimir. In 1870, Anyuta and another friend came to join the menage. This was difficult for Kowalesky; he moved out and then went off to Munich to study.

During this period Sonya decided that she wanted to devote herself entirely to mathematics and that there was one man with whom she most wanted to study. This man was Karl Weierstrass at the University of Berlin. In the fall of 1870, she and Yulya travelled to Berlin where Sonya found the situation even more difficult than it had been in Heidelberg. Women weren't even permitted to audit classes at the university. She wrote to Weierstrass and asked him to take her as a private pupil. He sent her some problems to do, probably assuming that she would be discouraged and give up, but she sent him such impressive solutions that he agreed to teach her privately. This was the beginning of a life long relationship. In a short time, Weierstrass came to regard her as one of his most promising students. He not only lectured her on what he was teaching at the university, but shared with her many of his mathematical ideas and much of his current work. He found her mathematical companionship very rewarding and considered her a close and intimate friend.

For four years Sonya drove herself extremely hard at her mathematics, to the exclusion of all else. In 1874 she finished three articles, any one of which, Weierstrass claimed, would make a fine doctoral dissertation. The problem was to obtain a degree for her. After all, she couldn't even matriculate at the university in Berlin. Weierstrass approached the university at Göttingen where there was a precedent for awarding degrees in absentia to foreigners. After many objections, Göttingen finally agreed and she submitted her article "Zur Theorie der Partiellen Differentialgleichungen" as her doctoral dissertation.

In this paper she proves the theorem we now know as the theorem of Cauchy-Kowalesky. The problem in this paper was first posed by Cauchy although Kowaleskaya attributes it to Weierstrass. This is probably indicative not only of Weierstrass' great influence on her but also of the fact that she didn't have any exposure to other mathematicians. The problem is the following. Given a linear partial differential equation with real analytic coefficients, find conditions for which there exists a unique real analytic solution. Using power series, Kowaleskaya proved that if the initial data are also real analytic and are not on a characteristic cone, or tangent to one, then there is a unique analytic solution in a neighborhood of the initial point.

Darboux also published a solution to this problem in the same year and it is interesting to note that he also made no mention of Cauchy.

After receiving her degree, Sonya and her husband decided to go back to Russia to live and to turn their fictitious marriage into a real one. The reasons for this decision are not at all clear. She was completely exhausted by the years she had spent in Berlin and there seem to have been pressures from her family to return. One of her early biographers points out that Sonya suffered from what today would be called "fear of success" most of her life, and this may have been an important factor in her decision. In Russia it was impossible for her to teach. However, not only didn't she teach, she didn't do any mathematical research or respond to the letters Weierstrass continuted to send her during this period.

In the six years Sonya spent in Petersburg, her personality began to open out and she began to develop some of her other interests. She worked as a theater reviewer and science reporter on a newspaper, made many friends in literary and intellectual circles, and began thinking about psychology. She also collected material which she would later use in her non-mathematical writings. In 1878 she participated in organizing the "Bestuzhev Higher Courses for Women" which was hoped to be the nucleus of a women's university. She was not invited to teach, however, because she was considered a dangerous nihilist and radical.

Vladimir had hoped to find a university position on his return to Russia but he was unsuccessful. The Kowalesky's decided that they would have to earn enough money somehow so that they could pursue their scientific work outside the universities. Sonya's father died in 1875 and left Sonya without her regular income, but with a small inheritance. Vladimir invested this inheritance in real estate. Unfortunately this was not a successful adventure and they lost most of the inheritance.

Sonya became more and more unsatisfied and unhappy in Petersburg and decided to go back to mathematics. To this end, in 1878, after a three year silence, she sought the advice of her friend and teacher Weierstrass. He was very encouraging but her daughter's birth in October of that year, the illness which followed it, and the characteristic way in which she devoted all her energy to her child prevented her from implementing her decision for a while. This preoccupation with domesticity was not satisfying for long; her relationship with her husband was deteriorating; and it is therefore not surprising that when the mathematician Chebyshev invited her to give a paper at the Sixth Congress of Natural Scientists in 1880, she jumped at the chance.

She quickly translated the second of the three papers she had written six years before into Russian and presented it at the Congress. It is entitled "Ueber die Reduction einer bestimmten Klasse Abel'scher Integrale 3ten Ranges auf elliptisches Integrale." The problem is the following. Given a Riemann surface with a basis for the Abelian differentials on the surface, to express the coefficients of a special class of differentials of the third kind, written in terms of this basis, in terms of elliptic integrals.

One of the people she impressed with her talk was Mittag-Leffler. He offered to try to get her a position at the university in Helsinki where he was a professor. She was tempted but had doubts for herself, because of her family, and also because she was afraid that in support of her, Mittag-Leffler would hurt himself professionally. By this time, Sonya's relationship with her husband had deteriorated considerably and she took advantage of a prolonged business trip of his to take a trip to Berlin to see Weierstrass and to discuss Mittag-Leffler's proposal and her own mathematical ideas.

She decided to live abroad for a while and work on mathematics. She left her daughter in the care of her friend Yulya and lived the ascetic student life again, sometimes in Paris and sometimes in Berlin, working on a new project on the refraction of light in a crystalline medium. She published a paper on this work in the Acta Mathematica (vol. 6). In this paper, she finds solutions to certain differential equations of Lamé describing the problem. Unfortunately there are some mistakes in this work. Volterra, eight years later (Acta v. 16), shows that her solutions don't satisfy the equations. However, the important thing was that she was back at her mathematics.

In 1883 Vladimir Kowalsky was in serious financial trouble again and was faced with implication in a scandal. On April 27, 1883 he committed suicide by inhaling a bottle of chloroform.

Shortly after, Mittag-Leffler wrote Weierstrass that he had convinced the administration at Stockhold University, where he was now a professor, to allow Sonya to lecture there. She would be an unpaid lecturer. She accepted the offer and arrived in Stockholm in November 1883. She gave her first series of lectures in German to what Mittag-Leffler described as a "restrained and skeptical audience." In 1884 she was given a five year professorship, one of the first women in Europe to receive one.

Encouraged by Mittag-Leffler and Weierstrass, Sonya began working on a problem for which the French Academy was offering a prize of 3000 francs, the Bordin Prize. The problem was one which had been studied by Euler, LaGrange and Gauss and they had succeeded in solving only two special cases. The problem is that of determining the path of rotation of a solid body around a fixed point. The path is contained in an ellipsoidal shell. It can be thought of in terms of a gyroscope or as a satellite problem. The first of the special cases in which the solution was known is the one in which the fixed point is the intersection point of the three principal axes of the ellipsoid. The second case occurs when the ellipsoid is one of rotation and the fixed point is on the axis of rotation. Sonya solved another special case using her knowlege of elliptic and theta functions. In this case the ellipsoid is again one of rotation and one major axis is twice as long as the other. In addition she showed that in the general case there are not enough arbitrary constants to determine unique solutions in closed form.

The solutions submitted to the academy were judged without knowledge of the author (blind refereeing) and Sonya's was found so worthy that the prize money was increased to 5000 francs. She received the prize in 1888 (Acta Math v. 12).

Sonya's life in Stockholm was not purely devoted to mathematics. She became fast friends with Anna-Carlotta Leffler, Mittag-Leffler's sister. She wrote several plays with Anna-Carlotta. She wrote a reminiscience of her visit to George Eliot in England when she was nineteen. In the autumn of 1887 Anyuta died suddenly, leaving Sonya desperately lonely. The following winter she became emotionally involved with Maxim Kowalesky, a celebrated Russian philosopher who had been dismissed from his professorship in Moscow for his radical politics. She described him as a large man whose presence filled the whole room. He proposed marriage on the condition that she give up her work. This was clearly an unacceptable proposal. Maxim Kowalesky accompanied her to Paris to receive her award. However as soon as the festivities were over he left sulkily and retreated to his villa in the south of France. It is ironic that Sonya's greatest successes were so often accompanied by personal unhappiness. Their relationship continued, although it was always stormy, throughout the rest of her short life. She told Anna-Carlotta that he inspired her to write and write she did. She produced a charming memoir of her childhood and a novel, "A Nihilist Girl." She was very concerned with her past and wanted very much to understand it.

Sonya also continued her mathematical work during this time. She produced several more papers and gave courses every semester at the university. She was an enthusiastic lecturer and inspired her students. She was made professor for life in 1889.

During the winter vacation in 1891 Sonya visited Kowalesky in the south of France. On the trip home, she arrived in Denmark without any Danish money and had to carry her bags through the pouring rain. She caught cold and din't take care of herself. The cold turned to flu and she died within a few days. It was certainly a needless and tragic death.

In 1893 Mittag-Leffler published an obituary in the Acta Mathematica (v. 16). He speaks of her as a most remarkable woman. She was remarkable for her mathematical and artistics talents but even more remarkable as a personality. She affected all those who came into contact with her very strongly. The totality of her life was greater than the sum of her individual achievements.

Sonya Kowaleskaya's life story is interesting not only because she was a good mathematician, or even because she wrote about other things as well, but because it brings up many questions about life which we still ask in our society. The problems she faced were not only problems of her time - obtaining admission to the university, obtaining a job, etc. - but also are problems that face us today. Even within the framework of our society Sonya would have found many things difficult. It would have been easier for her to become a mathematician. But the questions of understanding herself and other people, of dealing with her emotional needs for both work and love with their inherent conflicts, would not be more easily resolved today.

Sonya was buried in Sweden and on the centennial of her birth in 1950 the Russian government erected a new tombstone for her. They also honored her by publishing some biographical material, written by P. Polubarinova-Kochina, and the letters which Weierstrass sent to Sonya Kowaleskaya.

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AWM PROPOSAL
by Judy Roitman and Ann Stehney

We have written a five-part grant proposal for the AWM which will be sent out to various foundations. Here are the extracts which give the gist of the proposal:

Dissemination of career pamphlet

A booklet entitled Careers for Women in Mathematics has been written by the AWM. We have sent it on request to a small number of colleges, with enthusiastic response, and plan to distribute it at the national meeting of the National Council of Teachers of Mathematics. We want to send it to every high school guidance office and college career counselling center in the country, along with a covering letter. We ask the basic cost of this initial push. After this the project will become self-supporing, a fee being charged for bulk mailings, and single copies being sent only if the person requesting it encloses a stamped self-addressed envelope.

(Ed. note: if you're interested in receiving one or many copies of this booklet, let us know at the Wellesley office.)

Research on the history of women in mathematics

We are asking for $45,000 which we will distribute in grants over a three year period to support projects in the history of women in mathematics. Our mechanism will be a committee appointed by our executive committee, which will read proposals and have the power to approve them and to grant money. There will be a maximum of $15,000 to any individual.

Speakers' bureau

We are asking for money to mail a list of our speakers' bureau to every college and university in the country once a year for three years. We also ask for money to pay travel expenses within local regions. Institutions wishing us to pay speakers' expenses would apply to a committee appointed by the AWM executive committee, which would have the power to grant and refuse requests. This portion of the grant would also be for three years.

(Ed. note: if you're not on the speakers' bureau and would like to be, write to the Wellesley office. We need speakers for every educational level, especially outside the northeast.)

Travel grants for women at professional meetings

We ask for $10,500 for a three year period to be spent on travel grants: 3 grants each year for attending 3- and 4-week conferences (up to $500 each grant); and 10 grants each year for attending shorter conferences (up to $200 each grant). In order to prevent abuse and ensure that we really do address the problem at hand, we propose the following stipulations:

The money could be spent only for conferences in specific fields, e.g. ring theory, or logic. Travel to general conferences of associations would not be supported. No applicant could receive money for more than one conference per year, and applicants must have barely minimal (less than $100 per year) sources of travel funds to meetings in the academic year for which they are applying. Recipients would be chosen by a committee appointed by the AWM executive committee.

Speakers at AWM meetings

We ask for $1,800 over a three year period to cover grants of up to $300 per meeting for travel of our main speakers to the large national AWM meetings held each summer and winter. As we reach out more to speakers who may not be active in the AWM but who have something to say to our members, we will need some funds to partially defray their travel expenses.

Summary

There in a nutshell is our proposal. The spirit is to get seed money to get projects off the ground, and to emphasize projects needing little administrative overlay. As we get projects funded (currently none of them are - please don't write asking us for travel money! e.g.) we'll let you know in the newsletter. If you have any suggestions about who might fund some segment(s) of the proposal, let Ann know at Wellesley. If you have any suggestions for further components, let Lenore Blum, AWM president, know at Mills College, Oakland, California.

We emphasize that two components of this proposal are in partial operation. The career booklet exists and we are pleased to distribute it; the speakers' bureau exists without funds as a list of speakers for any institution wishing to be addressed by a woman mathematician.

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Southern California Meeting

An AWM meeting is planned to coincide with the MAA meeting on March 12 at Loyola Marymount University in Los Angeles. For further details contact Prof. Jacqueline Durer, Department of Mathematics, Loyola Marymount University, Los Angeles, Calif. 90045. Also, the AWM western representative, Sue Montgomery, is on sabbatical this spring. Ruth Afflack at Long Beach State will take over her duties for the semester.

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Sylvia Roberts

Sylvia Roberts is a nationally known attorney who is a leader in the movement to establish and improve the legal rights of women. She was the attorney in the landmark case against Southern Bell, and is currently involved in suits at the Universities of Maryland and of Pittsburgh; she has been on the board of NOW, and was a president of the NOW Legal Defense and Education Fund.

While president of the NOW LDEF she wrote a letter soliciting funds for the organization - the clients its lawyers represent are not charged a fee. In a move similar to ones used against civil rights lawyers in the past, the University of Pittsburgh charged Roberts with unprofessional conduct on, essentially, the grounds that this letter solicited clients, and made false statements (e.g. if Roberts won a case, the court might award her legal fees). Much of the legal community supports Roberts against these charges, but she now needs money for her own defense. Contributions should be designated as for Sylvia Roberts, and can be sent to: Legal Aid for Women, Dept. 6-J, Arrott Building - 12th floor, Pittsburgh, Pa. 15222, Attn: Judith Berger.

OF POSSIBLE INTEREST

The American Statistical Association's committee on women in statistics has written two short papers: Affirmative Action and Equal Employment Opportunity in the U.S.A., and Affirmative Action and Equal Employment Opportunity in Canada. To receive a copy of either, write to the ASA office, Suite 640, 806 15th St. N.W., Washington, D.C. 20005.

Do people tell you how things are getting better for women? The AAUP reports that the percentage of women faculty members went from 22.5% in 1974-75 to 21.7% in 1975-76; and that the average compensation of women was 4.5% lower than that of men in 1974-75, while in 1975-76 it was 5.2% lower. Meanwhile, Betty Vetter of the Scientific Manpower Commission reports that 20% of the women receiving doctorates in the sciences in 1973 had not found a job by the time they got their degrees, while only 14% of the men receiving science doctorates that year were similarly unfortunate. In the essay "Women in the Natural Sciences" (appearing in the journal Signs, Vol. 1, No. 3, Part 1, Spring, 1976, University of Chicago Press) she concludes that the status of women in science is not better than it was five years ago, before affirmative action was mandated by law.

Several of our readers have noticed that the Springer-Verlag mathematics calendar mentions no women (there is a picture of a female doll for the automata month). Let your conscience be your guide. (Mea culpa - I put in my 80¢ for my department's copy.) Comments or suggestions for next year might be sent to Renate Opoku of Springer's promotion department. (Thanks to Bertha Mather for this information.)

Springer-Verlag is publishing the collected works of Emmy Noether sometime soon.

The MIT Press is looking for names to add to its Mathematicians of our Time series. Included to date are Loewner, Rademacher, Hille, Wiener, Zariski, Erdos, Polya, and Ulam. None are women. Suggestions can be made to the MIT Press, 28 Carleton Street, Cambridge, Mass. 02142.

JR

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New newsletter schedule: for financial reasons we've cut down the number of issues. It now stands as follows: September-October, November-December, January-February-March, April-May-June, July-August-September. Job ad and copy deadlines are: September 15, December 15, March 1, May 15, July 15.

JOBS

The vacancies listed below appear in alphabetical order in an alphabetical listing of states. EO/AA means Equal Opportunity, Affirmative Action Employer.

California State University, Dept. of Math., 5 asst. prof. tenure track openings in algebra, analysis, statistics, numerical analysis and comp. sci. Deadline may have passed, so write immed. to Ms. Patti Owen, Dept. of Math., Cal. State Univ., 1250 Bellflower Blvd., Long Beach, CA 90840. Ph.D. req'd. AA

University of California, Dept. of Math., 1-yr. position post-doc. lecturer beg. Fall 1977. Sal. about $13,500 for academic year. Send vita and four letters of reference to Lecturer Comm., Univ. of CA, Santa Cruz, CA 95064 EO/AA

University of Connecticut, Dept. of Math., Visit. asst. or assoc. prof., 1 yr. non-renewable appt. (Position could be split into 2 1/2-time appts.) Duties include2 course load/sem. Preferred specialty: numerical analysis. Completed app., resume, and 3 letters of recommendation due Ap. 15, 1977. Contact: John V. Ryff, Head, University of Connecticut, Dept. of Math., Storrs, Conn. 06268

University of Delaware, Dept. of Math., Two Asst. Profs., one in unspec. field; other in area of optimization and math. program. Ph.D. and active research req'd. Teaching load 6-7 hrs. One sr. position and a 1-yr. visiting position may also become avail. Begin. Sept. 1, 1977. Contact: Dr. I. Stakgold, Chairperson, Dept. of Math., Sharp Laboratory, U. of Delaware, Newark, Delaware, 19711.

Northern Illinois University, Asst. Prof., Ph.D. req'd. w/ strong commitment to teaching and research. Specialization in Numerical Analysis, Mathematical Programming or Comp. Sci. pref., other strong candidates considered. Apply to D.B. McAlister, Chrmn., Dept. of Math. Sciences, Northern Illinois Univ., DeKalb, Ill. 60155 EO/AA

Sagamon State University, Management Program, teaching position in generic management. Team teaching in 24 sem. hr. core program w/ opp. to teach electives. Normal load 12 hrs. Rank: Ass't. Prof. Salary $15,000 to $17,500. SSU's needs in order: marketing and finance, finance real estate and insurance, policy, quantitative management, behavioral management. D.B.A. or Ph. D. in Bus. Admin. by 1977-78 desired. Teaching of prof. exp. pref. Gvt. exp. a plus. Contact: Dr. Edgar T. Busch, The Management Program, Sagamon State University, Springfield, Ill. 62708 217-786-6714

Western Illinois University, Dept. of Math., expects to offer visiting prof., temp. all or part of year. Teaching 1 class/quarter and directing research group - some area of Math. Sciences, Math. Education or comp. Sci. including Operation Research. Contact: Larry J. Morley, Dept. of Math., West. Ill. Univ. Macomb, Ill. 61455 EO/AA

Western Illinois University, Dept. of Math., one or two asst. profs. (tenure track); begin. salary w/no exp. $13,000; two postdoc. lecturers (1-yr. appt. w/poss. renewal for max 2 yrs.), reduced teaching load over year, salary $10,800-$11,700; one or two temp. 1-yr. instructors; min. req. MA degree, salary $9,000-$10,000 for full teaching load. Contact: Larry J. Morley, Dept. of Math., West. Ill. Univ., Macomb, Ill. 61455 EO/AA

Kansas State University. Dept. of Math., visiting prof., fall 1977 (Aug. 20 - Dec. 20), salary $8,000/semester. Sr. categorical topologist. Deadline Mar. 15, 1977. Contact John E. Maxfield, Head, Dept. of Math., Kansas State Univ., Manhattan, KS, 66506

Smith College, Instructor, 2/3rds pt. time, 2 courses/ sem., 6 hrs./wk, 1 yr. appt. 1977-78, fringe benefits pro rata, $7,666 sal. Apply: Chrmn., Dept. of Math., Smith College, Northampton, MA 01060. EO/AA

Wellesley College, Dept. of Math., Asst. Prof. begin. Fall 1977. Teaching load approx. 8 hrs./ wk. Possiblity of 3-yr. appt. w/ salary min. $14,000. Evidence of Ph.D. completed by 9/77 req'd. Contact: Howard Wilcox, Chairman, Dept. of Mathematics, Wellesley College, Wellesley, MA 02181 EO/AA

Present Executive Committee:

Lenore Blum, President
     Mills College, Oakland, CA 94613

Evelyn J. Boorman, Representative from the Midwest
     University of Michigan, Ann Arbor, MI 48104

Mary W. Gray, Representative from the East
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     Rutgers University, Camden, NJ 08102

M. Susan Montgomery, Representative from the West
     University of Southern California, Los Angeles, CA 90007

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     Wellesley College, Wellesley, MA 02181

Alice T. Schafer, Past President
     Wellesley College, Wellesley, MA 02181

Ann Stehney, Treasurer
     Wellesley College, Wellesley, MA 02181

H. Christine B. Stokes, Representative from the South
     University of Mississippi, University, MS 38677

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UMASS Boston, Math. Dept., Asst. Prof., Statistician to devel. and teach statistics, applications, and interdis. programs at BA and MA levels. Must have Ph.D. in Mathematics Statistics and give evidence of research potential. Send resume and list of references to Prof. T. Tanimoto, Chairperson, Dept. of Math., UMASS/Boston, Boston, MA 02125 EO/AA

UMASS/Boston, Math. Dept., Asst. Prof., Mathematician to help devel. computer concentration for Math. majors and to teach math. and comp. sci. at BA and MA levels. Must have Ph.D. in Math. w/ substantial experience in computer and computing and give evidence of research potential. Send resume and list of references to Prof. T. Tanimoto, Chairperson, Dept. of Math., UMASS/Boston, Boston, MA 02125 EO/AA

Mathematical Reviews Associate Editor. Assigning published articles, books to reviewers, editing reviews. Starts July 1, 1977 for 12 to 40 mos. Could be made part-time. Applications fm. mathematicians w/ research exp., fluency in Russian and writing abil. Strong competence in applied math. esp. sought. Send vita, bibliography, and names of 3 references to: Dr. R.G. Bartle, Exec. Editor, Mathematical Reviews, 611 Church St., Ann Arbor, MI 48109 EO/AA

University of Michigan - Dearborn Dept. of Math., position in Comp. Sci. w/ pref. interests in operating systems, information systems or artificial intelligence; possible position in Math. Educ.; add'l poss. position in sev. specialities in math. acceptable but pref. for applied math. as well as courses in speciality. Ph.D. req'd. Teaching load 9 hrs./term. Begin. Sept. 1977. Contact Prof. Roger Verhey, Chairman, Dept. of Math., Univ. of Mich. - Dearborn, Dearborn, MI 48128 EO/AA

Western Michigan University Two or more asst. professorships in Comp. Sci. or Math, starting Aug. 27, 1977. Ph.D. in math. science req'd. Teaching and research in field compatable w/ some of current faculty. Contact Dr. A. Bruce Clarke, Chrmn., Dept. of Math., West. Mich. Univ., Kalamazoo, MI 49008.

University of Mississippi, Dept. of Math., Assoc. Prof. or Prof. for Chm., also Asst. Prof. or Instructor. Contact Dr. Gordon Baird, Chm., Search Comm., Dept. of Math., University of Mississippi, University, MI 38677

Rutgers University, Dept. of Computer Science has several faculty openings starting Sept. 1977. An Assoc. or Full Prof. is available for someone with outstanding research accomplishments in artificial intelligence, computational complexity or the theory of algorithms. Other positions at the Asst.Prof. level are open to recent Ph.D's in computer science or related disciplines with backgrounds in language processing, operating systems, programming methodology, computers in education, information systems, A.I., or programming theory. Candidates should send vita and three references to: Prof. Saul Amarel, Dept. of Computer Science, Rutgers University, New Brunswick. N.J. 08903 EO/AA

Rutgers University Dept. of Math., applied mathematician knowledgeable in mathematical bio., beg. Fall 1977. Ph.D. req'd. Send vita, 3 letters of recommendation to Prof. Daniel Gorenstein, Chrmn, Dept. of Math. at New Brunswick, Rutgers Univ., New Brunswick, NJ 08903.

Colgate University, Dept. of Math., Instructor, max. tenure 3 yrs. Begins Sept. 1, 1977. Salary approx. $12,000. Candidates should have completed, or nearly completed a Ph.D. Submit vita to Wm. E. Mastrocola, Chairman, Dept. of Math., Colgate University, Hamilton, NY 13346. Three letters of recommendation req'd. Deadline Mar. 18,1977. EO/AA

State Univ.College. Potsdam, NY, Instructor/asst. prof. Ph.D. Math. Teach grad/undergrad. level. Salary commensurate w/ exp. Apply by Mar. 15 to Dr. Daniel Kocan, SUNY, Box 620, Potsdam, NY 13676

Union College, Dept. of Math., Asst. Prof. start. Sept. 1977 for 2 yrs. w/ possible renewal. Pref. fields: numerical analysis, applied math. Also sev. one or two yr. positions, any field of specialization. Strong teaching performance and continued research interests essential. Full fringe benefits. 9 hour teaching load. Contact: Arnold Seiken, Chairman, Dept. of Math., Union College, Schenectady, NY 12308. EO/AA

Slippery Rock State College, Math. Dept., Perm. position in Comp. Sci.,seeking outstanding teacher w/ Ph.D. and sev. yrs. exp. Practical as well as theoretical knowledge of computing. Data base theory and practice, structured programming and design, operating systems, languages, small and large systems, simulation, management and comp. architecture are esp. valued. Teach. elem. math. courses and membership in Math. Dept. expected. Send credentials to: Search Committee, Math., Dept., Slippery Rock State College, Slippery Rock, PA 16057. Resumes, academic records and recommendations must be received by Apr. 1, 1977 EO/AA

Temple University Dept. of Math., Two lectureships avail. in fall 1977 for recent Ph.D.'s in math. Appointments not to exceed 2 yrs. 3 course load. Salary $12,000. Send resume and letters recommendation to: Albert Schild, Chairman, Dept. of Math., Temple Univ. , Philadelphia, PA 19122 EO/AA

University of Pennsylvania, Phila. PA, Asst. of Assoc. Prof. Ph.D. in statistics w/ solid foundation intheory req'd. Strong interest in applications necessary. Start Sept. 1 1977, contact Prof. John S. de Cani, Chrmn., Sept. of Statistics, E-220 Dietrich Hall/CC Univ. of Pennsylvania, Philadelphia, PA19104 EO/AA

University of Pittsburgh at Johnstown, PA, Dept. of Math., Instruc. or asst. prof. Ph.D. pref. background in college teaching and/or industry desirable. Salary and rank depends on exp. Sept. 1977 opening, apply by Mar. 31, 1977 to Prof. John D. Wilson, Search Coordinator, Div. of Natural Sciences, Univ. of Pittsburgh at Johnstown, PA 15904.

Baptist College At Charleston, Asst. Prof., Fall 1977. Able to teach broad range of math courses, some areas of physics or comp. sci. Also, part-time, poss. full-time Instructor in math and/or physics. Apply by April 4, 1977 to Carolyn MacDonald, Chairperson, Dept. of Math and Physics, Baptist College at Charleston, Charleston. S.C. 29411 EO/AA

Converse College, Natural Science Div., Ass't Prof. Ph.D req'd, beg. salary $12,500. Must have strong interest in undergraduate teaching and ability to teach wide range of undergrad courses. Opp. for summer teaching in grad. prog. Contact: Dr. George Speed, Chairman, Converse College, Spartanburg, S.C. 23901

Texas Christian Univ. Ft. Worth, Dept. of Math., Asst. Prof., Ph.D. in math or stat. Load 9 hrs. w/ research in progress. Interest in teaching elem. stat. and intro. comp. sci. Dept. flexible concerning field of research. Title IX employer. Apply to L.S. Colquitt, Chrm., Dept. Math., Texas Christian Univ., Ft. Worth, Texas, 76129

College of The Virgin Islands, Visiting instr. or visiting asst. prof. of math. (remedial) 1977-78 academic yr. Start Aug. 15, 1977. MA req'd, Ph.D. pref. Teach 3 to 4 courses/sem. Salary $10,770-$15,400 for academic yr. Furnished College housing or housing allowance of $300/mo. Travel and shipping allowance. Economy jet fare to St. Thomas and back for appointee and family plus shipping allowance up to $1,000. Apply Chairperson, Div. of Science and Mathematics, College of the Virgin Islands, St. Thomas, U.S. Virgin Islands 00801 EO/AA

Northern Virginia Community College, Technical Mathematics. Teacher in 2-yr. college tech. math. begin. Sep. 1, 1977. 15 hrs. instruction/wk plus 10 office hrs. Teaching begin. and intermed. technician-oriented math (arithmetic through intuitive calculus) to students in auto, civil, and mech. eng. tech. MA req'd; education and/or exp. in engineering and math desirable. Deadline Mar. 31, 1977. Send resume to: Personnel Office, Northern Virginia Community College, 8333 Little River Turnpike, Annandale, VA 22003. EO

University of Virginia, 2 asst. profs., Sept. 1977 and 1 distinguished prof. Areas of primary priority: algebraic topology, algebraic geometry, and probability/statistics for the jr. positions. Ph.D. req'd. Send resume to Univ. of VA, Dept. of Math., Charlottesville, VA 22903

Washington State University, Dept. of Pure and Applied Math., Modelling Position; Ph.D. req'd. along w/ research abil. to quantify phenomena fm. natural and/or managerial sciences using sophisticated mathematical modelling techniques of analytical continuous and/or discrete nature. Begin. Sept. 1, 1977. Desire person capable of teaching advanced modelling courses and directing interdisciplinary theses. Contact David J. Wollkind, Dept. of Pure and Applied Math., Wash. State Univ., Pullman, WA 99164 by Mar. 1, 1977 EO/AA

Washington State University, Dept. of Pure and Applied Math., Statistics Position, Ph.D. req'd. along w/ knowledge of multivariate analysis, lin. models, stochastic processes for position begin. Sept. 1977. Desire person w/ research interests in bio. applications, esp. math. genetics. Contact Sam C. Saunders, Dept. of Pure and Applied Math., Wash. State Univ., Pullman, WA 99164 by Mar. 1, 1977. EO/AA

Washington State University, Dept. of Pure and Applied Math., Numerical Analyst Position, Ph.D. req'd. Pref. applicants w/ research interests in differential equations. Relevant industrial or consulting exp. desired. Contact J.S. Kowalik, Dept. of Pure and Applied Math., Wash. State Univ., Pullman, WA99164 by Mar. 1, 1977. EO/AA

West Virginia University, Dept. of Mathematics, sev. openings at asst. prof. level. begin. 8/15/77. Strong backround in applications. Engineering backgrounds w/ interest in research desirable. Undergrad. and grad. instruction and research. Ph.D. req'd. Sev. 1-yr. instructorships, teaching 4 undergrad. courses/yr. Should have MA. Contact: I. D Peters, Chrmn., WVU, Dept. of Math., Morgantown, WV 26505

University of Wisconsin-Milwaukee Asst. Prof., Dept of Math., Ph.D; demonstrated research interests in applied analysis and interdisciplinary applications of math. Salary $13,500-$14,500. Teaching and research in applied analysis at the grad. and undergrad. level, comm. work in developing applied program areas. Contact Prof. Lindsay A. Skinner, Chrmn., Dept. Math , EMS E404A, Univ. of Wisconsin-Milwaukee, Milwaukee, WI 53201 EO/AA

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Mar.-Apr. 1977