

# MPI

The Mathematics and Physics Institute NEWSLETTER

October 1, 1986

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## OUR THIRD YEAR

The Mathematics and Physics Institute entered its third year on Sept. 3, with an enrollment of 56 from seven of the eight high schools participating in the program. The first three days were spent in orientation activities in which the staff and students became acquainted, and even began to learn some names!

Our staff this year includes two High School Physics, and four High School Mathematics Teachers: Calvin Nelson (Physics) from Northeast, Larry Harding (Physics) from Fort Osage, Sheri Adams (Mathematics) from Truman, Al Morse (Mathematics) from William Chrisman, Joe Kaifes (Mathematics) from Van Horn, and finally a newcomer to the program, Charlie Watts (Mathematics) from Raytown High School.

The UMKC staff for the Institute consists once again of Teddy Lambson as Academic Coordinator, Richard Waring as Director and Physics Coordinator, and finally Richard Delaware as Mathematics Coordinator.

The students are divided into four sections, A, B, C, and D. Sections A,B,D are enrolled in Calculus I and Physics I, while Section C students are enrolled not only in Calculus I and Physics I, but Calculus II as well! All courses are identical to UMKC courses, though Calculus I for A,B, and D, and Physics I for all sections requires an entire year instead of the usual one semester.

Our student/teacher ratio is extremely good this year with 12-13 students in each of Sections A,B, and D, and 19 students currently in Section C, while each section is taught by one or two instructors, with one or two teaching assistants participating on problem solving days. In groups this small, much personal attention can be focused on each student, and we hope our students will make the most of it.

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## OUR HIGH SCHOOL TEACHERS 1986-87

In this column we will profile from time to time the mathematics and physics instructors assigned to the Institute by their various high schools and districts.

We are enormously pleased to be able to begin this column with an exciting announcement. One of the mathematics instructors participating in the Institute, Sheri Adams from Truman High School, who is also the Independence District Mathematics Coordinator has just been awarded the 1986 Presidential Award for Science and Mathematics Teaching. Three nominees are selected each year from Missouri by the Missouri Council of Teachers of Mathematics, and a similar selection is made in every other state. The final choice for each state is then made by the White House itself in conjunction with the National Science Foundation. The award entails among other things a \$5000.00 grant to the Independence District, which in

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this case will be applied to a program for Teacher Training in Problem Solving.

Our admiration, best wishes, and congratulations will go with Sheri when she travels Oct. 21 - 24 to Washington, D.C. to receive the award. We feel very fortunate to have her among the teachers at the Institute.

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### MPI ENRICHMENTS

Our first enrichment speaker this year was Dr. Henry Mitchell, Associate Vice Chancellor of UMKC and a biologist, who spoke on one of the topics he loves, 'Bats'. In spite of the apparent oddness of the subject, Dr. Mitchell's enthusiasm for his topic and wide-ranging knowledge impressed everyone present. This was Dr. Mitchell's third presentation to Institute students and staff, teaching us about these mysterious but surprisingly engaging flying mammals.

Scheduled for Oct. 1 is Dr. Ken Blundell from UMKC's Dept. of Mechanical Engineering. He will be discussing some topics of 'Robotics', as the head of the Design Team at UMKC. This will also be Dr. Blundell's third year addressing MPI students, and he is definitely being brought back by popular demand for his witty British delivery, and his working robot!

On Oct. 15, we'll be seeing a newcomer to our Enrichment program, Dr. Susan Peterson, the Curator of the Planetarium at the Kansas City Museum. She will be bringing a slide show and will

discuss some of the latest discoveries in Astronomy. If any of you have ever visited the Planetarium chances are she presented the show you saw.

Our normal Enrichment days are Wednesdays this year, but Thursday Oct. 23 will be a special enrichment day, when we host Dr. Mel Thornton from the Mathematics Dept. of the University of Nebraska at Lincoln who will also be in town to teach in the ADAPT (Accent on Developing Abstract Processes of Thought) program to be held that Friday and Saturday Oct. 24 - 25. (See information later in this newsletter.)

Dr. Thornton plans to have our students work on problems under his guidance, and will try to induce them to discover certain mathematical facts on their own. We will be moving down to the gym in order to have tables and chairs available to encourage this sort of active participation.

Oct. 29 brings Alice Diederich, a former research assistant at the KU Medical Center, who is a speaker for the national WAM (Women in Mathematics) program of the MAA (Mathematical Association of America). She will be introducing us to some of the uses of mathematics in medical research.

Friday Nov. 7 will be another special enrichment when Dr. Don Huffman from the Physics Dept. of the University of Arizona, in Kansas City for the Missouri Science Teachers Association Meeting, speaks on "Laboratory Studies of Interstellar Dust". He writes: "This talk will survey the

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observed optical effects of interstellar dust and describe recent laboratory and theoretical research aimed at understanding the nature of interstellar particles."

Our first MPI Field Trip of the year will take place on Wednesday Nov. 12, when we take all our students to Columbia, Mo. to visit the Nuclear Research Reactor and hear a lecture from a member of UMC's Physics Dept. This will be the longest trip we have yet attempted, requiring the whole day. Other trips have involved only a weekend day or fit into the time constraints of the Institute's usual daily program, so we are unusually excited.

Finally (for this newsletter at least), on Nov. 26 we'll be receiving a visit from another (as yet unchosen) speaker.

This column will continue with the Dec. 1 issue of this newsletter when we describe plans for our annual MPI Christmas Party, and our 'Former Students Panel Discussion on the first years of college' in early January. Stay with us!

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#### TEACHER WORKSHOP! - ADAPT

On Fri. Oct. 24 and Sat. Oct. 25, the MPI will be sponsoring an ADAPT (Accent on Developing Abstract Processes of Thought) Workshop for 8 hours each day. This program has been developed by Dr. Robert Fuller of the University of Nebraska - Lincoln, and Dr. Mel Thornton of Nebraska's Mathematics Dept., who will both be present for the two day Workshop, which will be held in Room 102 at the Truman campus of

UMKC, located behind the Truman Library on Highway 24 in Independence. The Friday session will last from 9:00 am - 4:30 pm, and the Saturday session from 8:00 am - 3:30 pm, with a one hour lunch break each day.

The workshop's aim is to introduce secondary high school teachers to some of Piaget's theories of cognitive development, and using analysis of one's own reasoning skills, film and videotapes documenting levels of reasoning in students, sample classroom demonstrations, reading of relevant articles, and more, to teach strategies for effectively incorporating these theories into classroom instruction.

One hour of graduate credit in Arts and Sciences will be provided by UMKC upon completion of the workshop, which will include a follow-up meeting in the Spring of 1987. The registration fee is \$12.00.

For more information, or to preregister, contact Richard Waring or Teddy Lambson at the MPI, 276-1272.

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## MATH FILMS

As part of the Institute's endeavor to provide a rich education, some short mathematics films have been incorporated as an integral part of the Calculus courses. Most of these are no longer than 15 min. and many are from the series of 14 Calculus films created under the auspices of the MAA (Mathematical Association of America). They are rented from University libraries across the country and shown to all four class sections at appropriate points in the Calculus courses. They have been a great success and allow the mathematics teachers to reveal visualizations of complex concepts which are difficult or impossible to produce at a chalkboard.

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## MISCELLANY

- \* Institute Brochures are always available upon request, from the MPI (276-1272) or from your local high school counselors.
- \* Video tapes of some previous Institute speakers are also available.
- \* Feel free to call us anytime if you have questions: 276-1272.
- \* Upcoming Articles:

Our former students - where are they now?

Who are our teaching assistants, anyway? And, what do they do?

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The MPI Newsletter is published on the first of the month during the months of August, October, December, February, and April at The Mathematics and Physics Institute, 600 W. Mechanic, Independence, Mo. 64050, phone (816) 276-1272. Please address all letters concerning this newsletter to 'Newsletter'.

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