

Imported science

Five Soviets work at university's Institute for Theoretical Physics

By Jim Dawson
Staff Writer

The name on one office door reads "Arkady Vainshtein." Another carries the name, "Mikhail Voloshin." Around the central reading room, filled with the sounds of scientists arguing in Russian, the names continue: Leonid Glazman, Mikhail Shifman, and Boris Shklovskii.

The place could be the famed Institute of Theoretical and Experimental Physics (ITEP) in Moscow, but it isn't. Nor is it the renowned Institute of Nuclear Physics in Novosibirsk.

It's the fourth floor of the physics building at the University of Minnesota.

The five Soviets, all highly respected theoretical physicists, have arrived at the campus over the past year and a half, and they are now five-sixths of the faculty at the university's Institute for Theoretical Physics. The other member of the institute is the director, Larry McLerran, who came from the Fermi National Accelerator Laboratory near Chicago in 1989.

These are the people who worry about the invisible universe that begins with the atom and gets steadily smaller. They search for quarks and Z particles and talk about particle families known as Bosons and Hadrons. They are trying to figure out how the universe works on the smallest,

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Staff Photo by Mike Zerby

Clockwise from top: Larry McLerran, with three Soviet scientists, Mikhail Voloshin, Arkady Vainshtein and Mikhail Shifman.

PHYSICISTS: Soviets' presence creates pride

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most fundamental, scale.

That five top Soviet scientists have come to Minnesota to form the core of the fledgling physics institute has been notable news in the national physics community, and Minneapolis is now known by physicists as "Moscow on the Mississippi."

Luring the theorists to Minnesota from some of the top Soviet physics institutes is somewhat of a coup, but it came after physics department chairman Marvin Marshak struggled for a couple of years to attract good American theoretical physicists to Minnesota's cold climate.

The institute was founded in 1987 with a \$1 million grant from Minnesota real-estate developer William Fine. Marshak and others involved in the institute were determined to staff it with top-rank scientists, but the search ran into difficulties.

Marshak told *Physics Today*, a national physics journal, that, "Theoretical physicists, like Bose particles, tend to cluster and this was not a part of the world where they had been clustering much."

Candidates fell into two groups, Marshak told the magazine: Those who were top scientists and those willing to live in Minneapolis.

With the new openness in the Soviet Union in the late 1980s, Marshak turned his attention there, and the result of his efforts are the five Soviet faculty members.

The reasons the Soviets came to the institute are both scientific and cultural, and the themes they raised in a discussion last week were similar.

The men faced travel restrictions, particularly the three who are Jewish. In the Soviet Union, one said, his nationality is listed on his internal passport as "Jew" and the

discrimination is strong.

Attending scientific meetings is extremely important for theoretical physicists, for it is at these gatherings that they can exchange ideas with other scientists who understand their work.

"For me, traveling abroad was difficult," said Shifman, who was a full professor at ITEP in Moscow. "Now it sounds funny, but in those gloomy years, being a member of the Communist Party was a plus, being a Jew was a zero." Shifman, a Jew, was not a Communist. He did very little traveling.

"But even communicating inside the country is difficult," he said. "You don't need the police to go to a conference in a different city, but you have to find the money, then arrange the flight, then get to the airport and find all the flights are canceled, then try to find a room. It's an adventure."

Shifman, who looks older than his 42 years, recalled his professor who "for 30 years received invitations to scientific meetings. He had drawers full of invitations. He was never allowed to go."

For Shifman, working in the Soviet Union "was extremely humiliating. I was just dust under their feet. When I was younger I worked out a special attitude (that helped him to focus on his work). With the years going on, that was more and more difficult."

Vainshtein, a scientist at the Novosibirsk Institute of Nuclear Physics before coming to Minnesota, was able to travel, but it was never easy. "I traveled once every six years, and it took three years to arrange a trip," he said.

One of the five, Boris Shklovskii, 47, was never allowed to travel despite being a full professor at the University of Leningrad and winner of the prestigious Landau Prize in physics.

All credited President Mikhail

Gorbachev with loosening the restrictions enough to allow them to come to Minnesota, and three of the scientists have joint appointments with their Soviet institutions, which means they can return if they wish.

The instability in the Soviet Union, combined with the new freedom, has prompted a scientific brain drain that has seen 87 Soviet physicists and 47 mathematicians come to U.S. institutions for at least three-month stays since July of last year.

"Science and education is not so bad in the Soviet Union," Voloshin said, "but the development of science and the organization of science is different here. Now, the flux is mainly in one direction."

The difference between the two countries is apparent in many ways, they said. Voloshin describes the science education his son is receiving at Blake School in Minneapolis as "not so good," even though the school is one of the most academically demanding in the area. The U.S. education system gives children too much information and "no thinking," Voloshin said.

The youngest of the five scientists, Leonid Glazman, 33, came to Minnesota because of a long family history of being persecuted for being Jewish.

His mother, a mathematician, was fired twice in her career during "outbreaks of anti-Semitism," Glazman said. When he was 15, he won the physics olympics in Moscow and a close friend, who was also Jewish, came in second. Soviet authorities would not send two Jews to the national competition, he said, so his friend was dropped in favor of the third-place finisher, a Russian. "That hurt," he said.

"In the last few years, it has become easier with your job because the government isn't being anti-Semitic. But I'm afraid of the anti-Semitism on the streets. In everyday life the level of anti-Semitism is high."

U becomes Moscow on the Mississippi

■ Minnesota has attracted some of Soviet Union's top research scientists

PATRICK SWEENEY STAFF WRITER

For years, a number of University of Minnesota physicists have lunched together at a long table in the faculty club. This fall, a second table was pulled up to accommodate five new tenured professors and eight visiting scientists.

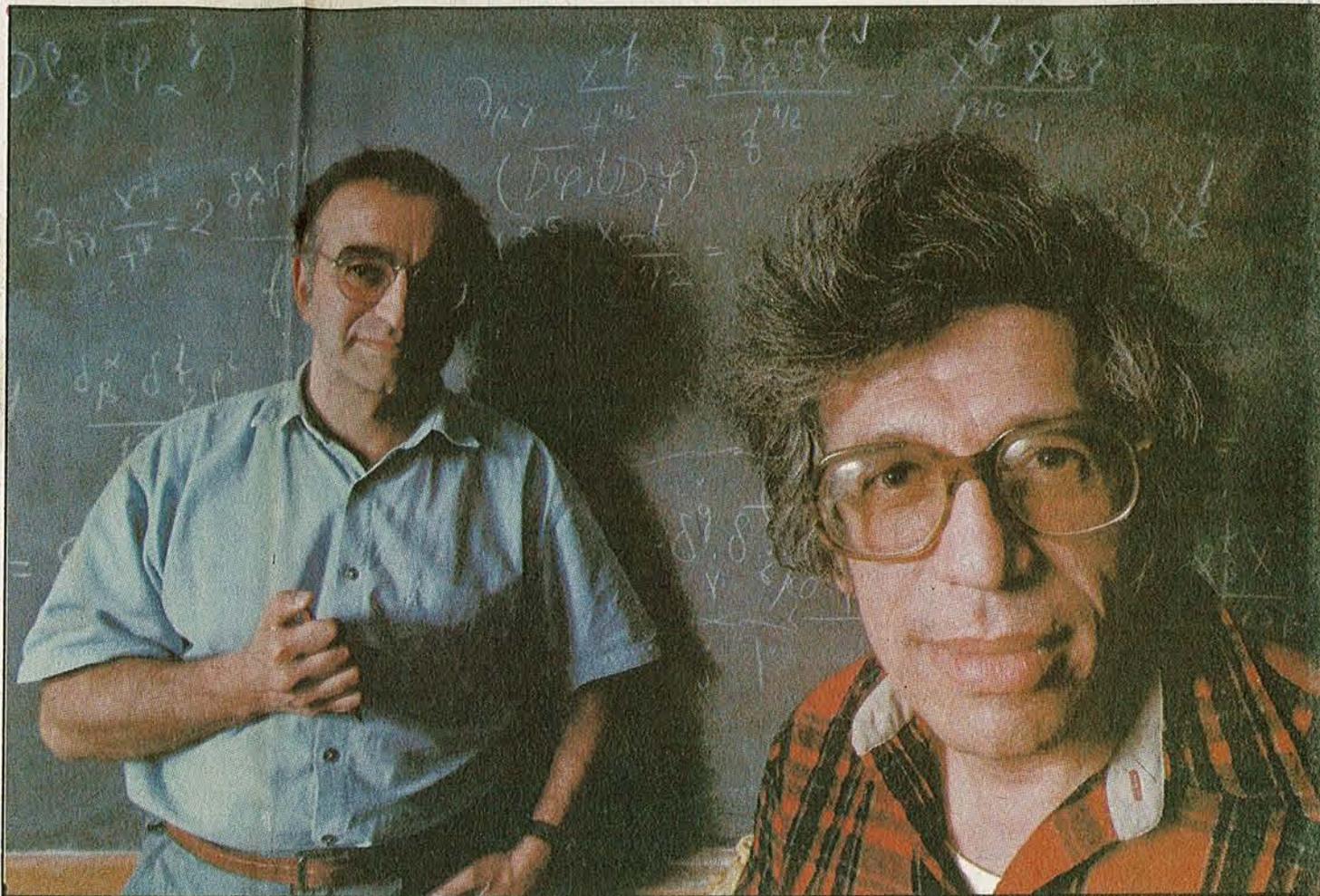
Much of the conversation is about physics, but lately it has often turned to the ethnic turmoil in the Soviet republics and to Mikhail Gorbachev's effort to cure the dismal Soviet economy.

The five new professors, who include some of the top theoretical physicists in the world, and the eight visiting professors, who will be at the university from one to four months, are all from the Soviet Union.

Welcome to what a Princeton University physicist called "Moscow on the Mississippi."

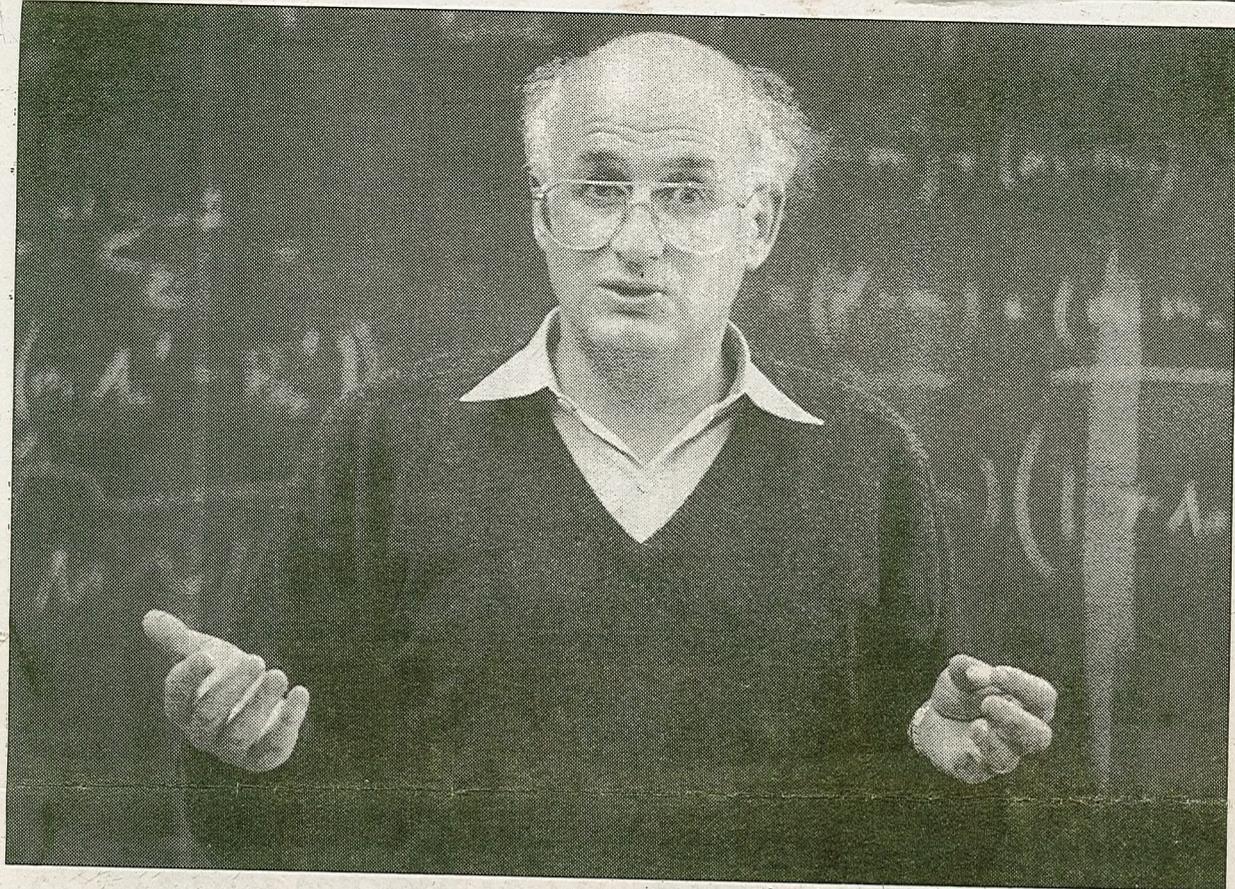
Gorbachev's relaxation of travel restrictions, along with deteriorating living conditions, resurgent anti-Semitism and the threat of ethnic violence, have produced an exodus of Soviet scientists. And the University of Minnesota is at the forefront of U.S. research universities who are aggressively hiring them.

"The most important thing is just not



RICHARD MARSHALL/STAFF PHOTOGRAPHER

Soviet physicists Boris Sklovskil, left, and Arkady Vainshtein are among five Soviets who have recently joined the University of Minnesota physics department.



RICHARD MARSHALL/STAFF PHOTOGRAPHER

Russian physicist Mikhail Shifman teaches a course in advanced field theory at the university. The scientists have left the Soviet Union because of economic and ethnic turmoil there.

PROFESSORS/Minnesota successful recruiter

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to have the feeling that the next day there may be shooting in the streets," said Mikhail Borisovich Voloshin, one of the new professors.

This summer, the university's Institute of Technology hired and granted tenure to the five physicists and to a Soviet mathematician and a professor of aerospace engineering.

This allowed the university to fill five of six professorships in a new Theoretical Physics Institute almost overnight. Searches had been under way to fill the jobs for two years. Two of the new professors, Arkady Vainshtein, a specialist in high-energy physics, and Boris Shklovskii, whose field is condensed-matter physics, were named to prestigious endowed chairs in the institute.

Vainshtein and two of the other new professors, Mikhail Shifman and Voloshin, had worked together in the Soviet Union and were recruited to the university as a team.

"They are three first-rate Soviet physicists who would be a positive contribution to any institution in the U.S.," said Robert Jaffe, a physics professor at the Massachusetts Institute of Technology, who has been active in efforts to recruit Soviets there. "These guys would rank in the top 10 on anybody's list."

The mathematician, Nicolai Vladimirovic Krylov, earned a measure of fame in the 1970s when he helped solve a problem in linear partial differential equations that had stumped mathematicians for 50 years.

"These people are well-known, and they are stars," Marvin Marshak, head of the physics and astronomy department, said of the new physics hires. MIT, Princeton and Minnesota have been among the most successful schools in the nationwide scramble to recruit Soviet scientists.

The Soviets at the University of

Minnesota say they left their own country both because of an economy that offers the worst of two worlds: low salaries that are controlled by the government and prices that are increasing as the nation lurches toward free enterprise. They were also afraid that long-suppressed ethnic frictions will drive the country to chaos and civil war.

"The average salary in the Soviet Union is about 220 rubles per month," Voloshin said. "Now, the salary of a physics professor is 400 rubles a month. The salary of a bus driver is 500 rubles a month."

Eggs recently were selling for 3 rubles apiece. And on the black market, where Soviets buy some foodstuffs and other products not available in the government-controlled stores, the 400-ruble salary translates to about \$1 a day.

At the University of Minnesota, the Soviet professors earn \$60,000 to \$80,000 a year.

Shklovskii, like many of the scientists who have fled the Soviet Union, is Jewish. He said many Soviet Jews fear anti-Semitism is on the rise. But, he said, "I believe that not only Jewish people are afraid... Nobody knows whether the system can survive."

The Soviet physicists here say they like most things about Minnesota, including the weather, which is like their homeland's. They don't like the public school systems, which they say aren't up to the standards of the schools their children left.

What they miss most, they say, is the larger scientific faculties at the research institutes they left behind and a more animated style of debating their research theories.

Seminars among physics faculty members at the university are "too polite for us," Shklovskii said. In the Soviet Union, Voloshin said, such seminars tend to be raucous affairs, with scientists wrestling the chalk away from one another and pushing their way to the

blackboard.

"It is considered a good habit to end the discussion in one hour," Voloshin said of the seminars in the U.S. "In the Soviet Union, we go on for four hours."

All of the Soviets hired so far by the university are technically on joint appointments with the research institutes they left, although they must apply for permanent residency in the United States as a condition of receiving tenure.

There is an expectation that many of the new professors will return to the Soviet Union for perhaps one-third of each year and that some eventually might return permanently. Also, the joint appointments are a face-saving gesture that allows the leaderships of the Soviet institutes to pretend they really have not lost the country's scientific elite.

"It is difficult to live without hope — that our country will not be better," said Vainshtein, who has two grown children living in the Soviet Union.

The Soviet government's easing of travel rules caused a rush by scientists to find jobs or visiting appointments in the West that is depopulating the Soviet Union's government-sponsored research institutes.

"What's happening right now in the Soviet Union is very sad," said Larry McLerran, the director of Minnesota's Theoretical Physics Institute, who recruited most of the professors to Minnesota. "It's as if Harvard, Princeton, MIT, Stanford and Berkeley all went bankrupt and people were trying to stay alive feeding themselves."

Jaffe echoed McLerran's assessment.

"I think the leadership of Soviet science is gone," he said. "The great Soviet theoretical physicists are gone from the Soviet Union. They are at Princeton and MIT and Michigan and Minnesota, and such places. In some sense, they've lost their first string and their second string."