RLE undercurrents

Volume 10, Number 2 • Fall 1998

A Newsletter for the RLE Community at MIT

Behind the Scenes in Condensed-Matter Physics Research

*The fall 1998 issue of **RLE currents** showcases the research of RLE principal investigators in RLE's Quantum-Effect Devices and Surfaces and Interfaces groups working in the area of condensed-matter physics. In this **RLE undercurrents** article, we profile those people "behind the scenes," the staff and students who support their research efforts.*

Administrative Assistant **Margaret E. O'Meara** provides secretarial and administrative support to seven professors in the MIT Physics Department including four RLE principal investigators: Professors John D. Joannopoulos, Tomás Arias, Patrick A. Lee, and Xiao-Gang Wen. Employed at MIT for over 34 years, Margaret has been working in the Physics Department since September 1995. She also supports the academic and research efforts of Professors A. Nihat Berker, Mehran Kardar, and Leonid Levitov. Margaret finds the work invigorating and likes the fast paced environment. Before joining the Physics Department, Margaret was employed at the National Magnet Laboratory.

Margaret lived in Somerville all her life until three years ago when she moved to Westwood to be closer to her riding stable. Margaret has been riding horses since 1988, and she says, "It's all I want to do." She rides three days a week, taking lessons in dressage and jumping. Riding helps her reduce stress, and she loves being outdoors.

Gardening is another love of Margaret's. She is fascinated with orchids, remarking, "They are incredible plants that require lots of individualized care." At one time, she had almost three dozen different plants. At present, she coddles a half dozen plants in her office in Building 12.

Research Assistant **Paul I. Glicofridis** works with Professor Raymond C. Ashoori to develop methods for imaging the quantum Hall effect. The task of collecting images which show this effect is a new and challenging one and is being pursued by several research groups worldwide. Paul enjoys the competitive challenge and is quite proud of his results.

Paul has always been interested in science and the way things work. He became interested in physics at age 16 because it combines the abstraction of math with the concrete grounding of experimental science. He enjoys the practical bent of his current work and its connection to theory. A citizen of Greece, Paul came to MIT three years ago, after graduating from Imperial College in London in 1995. Greece does not have a prestigious technical university, Paul says, in part because its economy is not strong enough to support such interaction between academia and industry.

Paul likes to play the piano, which he says helps him to relax, and he enjoys swimming, which he learned on the gorgeous beaches of Greece.

Research Assistants **Nicole Y. Morgan**, **K. Jessica Thomas**, **Jörn Göres**, and **David J. Goldhaber-Gordon** work with Professor Marc A. Kastner on basic research in two distinct areas of condensed-matter physics: quantum dots and high-temperature superconductors. Both areas involve basic research that will likely lead to applications in new technology.

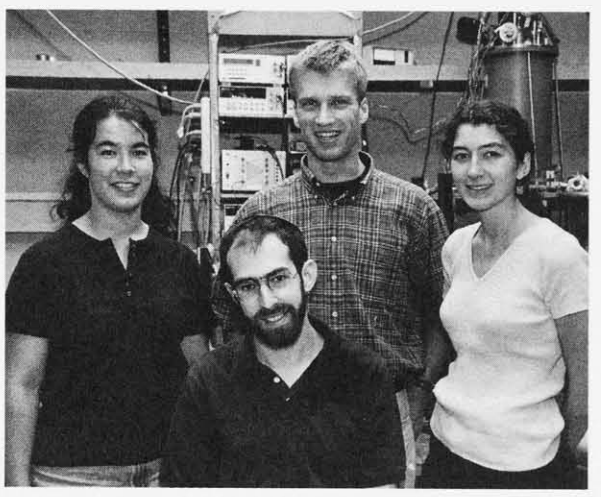
The research of fifth-year doctoral student **Nicole Y. Morgan** centers on the interactions of around 50 confined electrons. This system is much more difficult to predict than a system of just a few electrons, but is not sufficiently large to use statistical methods.

In high school in Washington, D.C., science was one of Nicole's many interests. During her sophomore year at the University of Chicago, she decided to focus on physics. Experimental science caught her interest, she says, because the research contributes to the progress of the field in a concrete and measurable way. Condensed-matter physics attracted Nicole both for its interesting subject matter and because the small scale of the experiments allows greater control to each researcher.

Nicole studies modern dance, as both a hobby and exercise, at Green Street Studios in Central Square and has worked with MIT's Dance Troupe as both a dancer and a choreographer.

K. Jessica Thomas, a second-year doctoral student, studies magnetic and optical properties of high-temperature superconductors. Jessica finds this area of research quite exciting because it links observable behavior–such as high-temperature superconductivity–to the collective behavior of the atoms in the material.

Like Nicole, Jessica recalls being a generalist in high school, not focused squarely on science. She chose to major in physics while at Yale because she was attracted to the analytical thinking and because it seemed an unusual choice. Now, she finds in it the satisfaction of seeking behind-the-scenes explanations of everyday events, which she likens to reverse engineering: working backward from effect to cause.



From left, Research Assistants Nicole Y. Morgan, David J. Goldhaber-Gordon, Jörn Göres, and K. Jessica Thomas.

When not in the lab, Jessica enjoys spending time outdoors, bicycling, and exploring Boston.

Jörn Göres, also a second-year doctoral student, hails from Germany, where, apart from one year of graduate study at the University of Connecticut, he lived until coming to MIT. Jörn works with David Goldhaber-Gordon studying lateral quantum dots, a unique type of quantum dot whose study could lead to the use of single-electron transistors for extremely small computer chips. This area of research is very exciting, Jörn says, as it provides the possibility of exploring the strange effects of quantum mechanics with implications for many other areas in physics.

Jörn has been interested in science since his early high school years. His early interest in astronomy grew into an interest in physics largely from popular science books and magazines. Physics appeals to him because of the fundamental concepts involved that often connect seemingly unrelated areas within the field.

When not in the lab, Jörn enjoys sports, such as tennis, running, and skiing, and likes to read novels. These activities, he says, help give balance to his life.

David J. Goldhaber-Gordon is a fifth-year doctoral student who is working with Jörn investigating lateral quantum dots. He expects to earn his degree by January 1999 and then will continue on as a postdoctoral associate.

David was always interested in the way things work and became especially interested in physics in high school, a development that he credits partly to a particularly good high school science teacher who inspired David to believe that even as a high school student one could do interesting research. After three years of undergraduate work in physics at Harvard, however, David was not certain that he would continue. He pursued a fourth-year master's degree in the history of

(continued on page 2)

Behind the Scenes, *continued from page 1*

science, which he found placed contemporary physics in context and made its meaning clearer. He also missed doing physics.

David enjoys a number of games including chess, bridge, and robo-rally, a game that requires players to program robots to run a maze, taking into account the inevitable collisions with other robots. David played the cello for 14 years while growing up and has recently taken it up again after more than two years away. He looks forward to playing Bach's *Suites for Unaccompanied Cello*.

David is married to Ilana M. Goldhaber-Gordon, a graduate student in the Biology Department at MIT.

Sven Heemeyer, research assistant with Professor Xiao-Gang Wen, studies the role of quantum effects in increasingly small electronic circuits. His research is in the border region between quantum mechanics and classical mechanics. Developing new mathematical models which might be applied to electronic circuits is his goal.

A native of Köln, Germany, Sven earned his diploma from the University of Köln in 1993. A sixth-year doctoral student, Sven began working with Professor Wen in 1995 and plans to graduate in 1999.

Sven enjoys classical music and attending concerts. "Boston is a great city where there is lots of music," Sven says. He likes both downhill and cross-country skiing in Vermont and New Hampshire. A former president of MIT's European Club, Sven is active in the organization and enjoys the barbecues, cultural events, and other activities. He likes the New England weather, especially the dramatic changes of seasons.

Research Scientist Dr. **Pierre R. Villeneuve**, Postdoctoral Associate Dr. **Shanhui Fan**, Research Assistant **Attila Mekis**, and Research Assistant **Steven G. Johnson** are working on understanding the theory of photonic structures with Professor John D. Joannopoulos. A second group working with Professor Joannopoulos studies semi-conductor surfaces and the properties of their electronic structures. This group includes Research Assistant **Ickjin Park**, Research Assistant **Tairan Wang**, Attila Mekis, and Shanhui Fan.

RLE *undercurrents*

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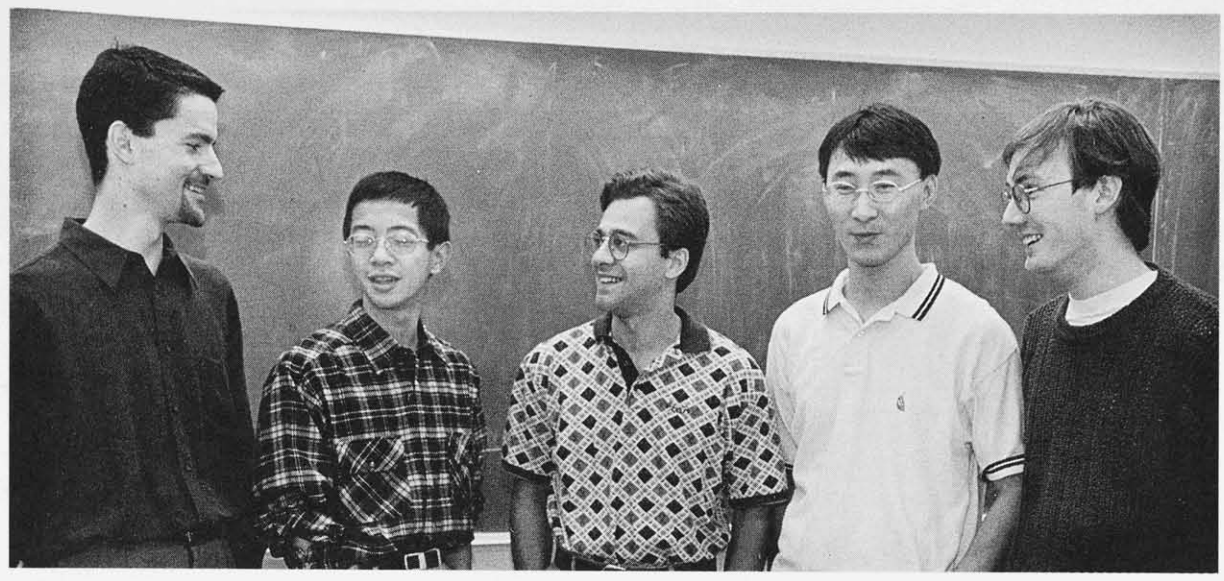


Top photo: from left, Research Scientist Dr. Pierre R. Villeneuve and Research Assistants Tairan Wang, Attila Mekis, Ickjin Park, and Steven G. Johnson. Bottom: from left, Postdoctoral Associate Dr. Shanhui Fan and Research Scientist Dr. Pierre R. Villeneuve.

Dr. **Shanhui Fan**, postdoctoral associate, does computer simulations of photonic crystals. He received the Ph.D. in physics from MIT in 1997. Shanhui, a native of Guangzhou in southern China, attended the University of Science and Technology in Hefei, China, from 1988 to 1992. In college, he became interested in condensed-matter physics and later decided to pursue a doctoral degree in this area. He likes helping the graduate students in the group by providing advice and guidance. Shanhui enjoys sailing and playing tennis and table tennis.

From St. Charles, Illinois, Research Assistant **Steven G. Johnson** earned bachelor degrees in mathematics, electrical engineering and computer science, and physics from MIT in 1995. Steven began working with Professor Joannopoulos' group in 1996 because of its strong connections to experiment and practical systems and because Professor Joannopoulos' research ties in well with his interest in computation.

Steven uses numerical simulations to model photonic crystals and also applies theoretical principles to understand them on a higher level. There are many practical applications of these systems. For example, one can build a better laser by controlling the direction of emission and by enhancing the lasing efficiency. His paper, "Elimination of Crosstalk in Waveguide Intersections," will appear in *Optics Letters* in December 1998. He has published papers on fast Fourier transform algorithms with a colleague from the Laboratory for Computer Science.

Steven takes voice lessons and sings in the MIT concert choir and in church. Steven is responsible for a group web page (http://ab-initio.mit.edu).

Research Assistant **Attila Mekis** is a citizen of Hungary. He received the bachelor's degree in physics from Yale University in May 1995. Attila began working with Professor Joannopoulos in June 1995 as a doctoral student. Currently, his research involves studying and designing photonic crystal devices that can be used as components in all-photonic microcircuits. Attila is married to Ruth Mekis.

Research Assistant **Ickjin Park** is a native of South Korea, where he earned his M.S. in physics from Seoul National University in 1993. He became interested in materials science in high school and found that physics was a good foundation for further studies. Ickjin joined Professor Joannopoulos' group in September 1993 as a doctoral student. He likes the theoretical studies which include computer simulations because they are similar to experiments.

He says Boston is a great city; he especially likes the Newbury Street area, always finding new things of interest there. Ickjin is married to Mi R. Chung, and they have a 20-month-old daughter, Katherine.

From Quebec, Canada, Research Scientist Dr. **Pierre R. Villeneuve** received the B.Sc. in physics-mathematics from the University of Ottawa and the Ph.D. in physics from Laval University. A postdoctoral associate with Professor Joannopoulos from January 1994 through April 1996, Pierre was promoted to research scientist in May 1996. Pierre finds fundamental research both stimulating and satisfying and enjoys applying the research to developing novel devices and components.

Pierre loves outdoor sports. He is an active cyclist, cross-country skate skier, and hockey player. Pierre competes for and coaches a local Boston-based cycling team.

Research Assistant **Tairan Wang** is a third-year graduate student studying optical properties of silicon and new materials. His most recent project was a search for new materials which can be created easily and which are good for transmitting light for optical communication (e.g., fiberoptic telephone lines). He used computers to predict properties of new materials which may then be fabricated and tested. This research combines aspects of physics, computer science, and engineering, all major interests of his.

Tairan earned his undergraduate degree from MIT, majoring in both physics and electrical engineering and computer science. In high school, he was first interested in math but soon found physics attractive because it has a concrete element that satisfied the engineer in him.

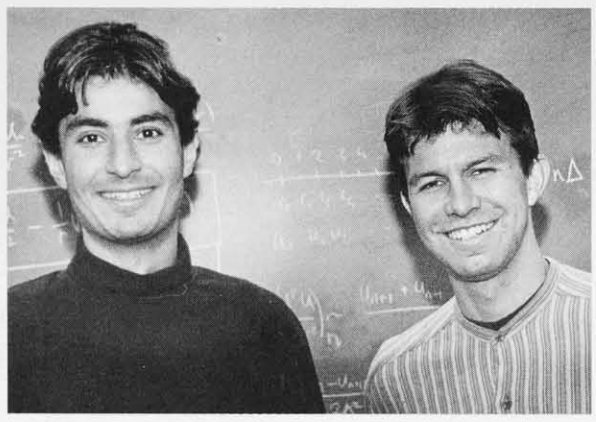
Tairan enjoys learning to sail on the Charles River, rollerblading, jogging, and playing ultimate frisbee with friends. Since completing his undergraduate studies, Tairan has been spending more time getting to know Boston and its offerings in the arts. He has attended concerts at the Hatch Shell and a ballet production of *An American in Paris* at the Wang Center.

(continued on page 3)

Behind the Scenes, *continued from page 2*

Research Assistant **Dirk Lumma** is a fourth-year doctoral student with Professor Simon G.J. Mochrie. Dirk grew up in Germany and earned his bachelor's degree from Harvard University, where he studied both physics and philosophy. At the time, his interest in the two subjects was closely connected, yet his general interest in philosophy has no connection to his current work in physics. He uses x-rays to study how specific structures can be made to arise in melts of a copolymer architecture consisting of two blocks of organic polymers. This is a challenging task since such organic materials are easily damaged by x-rays. When Dirk first came to MIT, he earned a master's degree in plasma physics. For the past three years, he has been working on condensed-matter physics with Professor Mochrie. Besides enjoying the complex problems that remain to be solved in this subfield of physics, Dirk enjoys the fact that the scale of these experiments is smaller, allowing for closer contact with faculty.

Research Assistants **Torkel G. Engeness**, **Sohrab Ismail-Beigi**, and **Dicle Yesilleten** work with Professor Tomás Arias to develop new methods for improving the accuracy and efficiency of *ab initio* quantum-mechanical calculations for understanding the behavior and properties of electronic structures.



Research Assistants Sohrab Ismail-Beigi (left) and Torkel G. Engeness

Torkel G. Engeness, from Trondheim, Norway, was fascinated by natural phenomena at an early age and while in high school decided to study physics. After one year as an undergraduate at the University of Trondheim, Torkel spent two years in military service. In 1994, he came to MIT to finish his undergraduate degree. Torkel began working with Professor Arias in 1996 as a doctoral student.

Torkel is active in MIT's European Club, serving on its board of directors. He likes many different sports and plays midfield on the European Club's soccer team. After several months of preparation,Torkel ran in the Bay State Marathon, which took place on October 18th in Lowell, MA.

Born in San Francisco, **Sohrab Ismail-Beigi** grew up in Iran. When he was 13, his family moved to New York City. Sohrab earned a bachelor's degree in physics in 1993 from Harvard University. He spent the next academic year at the École Normale Supérieure de Lyon in France, earning the equivalent of the masters degree. In fall 1994, Sohrab enrolled at MIT, and in January 1995 he started working with Professor Arias as a doctoral student. He finds his research challenging, in part because of the complexity of the necessary calculations and determining the appropriate computational approach for each problem.

Sohrab enjoys studying ancient Greek at Harvard, taking poetry classes at MIT, and dancing with the MIT ballroom dance team.

Dicle Yesilleten, a citizen of Turkey, received her bachelors degree in physics from MIT in June 1997. She has been working with Professor Arias since June 1995. Dicle studies the nature of various materials using the simple laws of quantum mechanics. In one project, she is building a model of the structure of iron to understand how it is magnetic and strong at the same time. In another project, Sohrab and she are trying to explain fracture in molybdenum by looking at certain defects in the metal's structure.

Driving around outside the city each day in her new car is fun for Dicle. Dicle loves to watch videos and owns about 60 of them. She reads a great deal and also loves to write fiction. Dicle recently completed a short novel that she is hoping to have published in Turkey. She is now working on another book.

Over the Weather

Since the mid-1960s, RLE's Remote Sensing and Estimation group has conducted high-altitude weather research. The research group has designed and built a millimeter-wave temperature sounder (MTS) to take measurements which are used to estimate atmospheric temperature and to image precipitation and severe storm structure. Since the 1980s, the MTS package has been flown in a wingpod of the ER-2, a special NASA aircraft, as part of a larger cooperative effort with several universities and the National Aeronautics and Space Administration (NASA).

The RLE project is led by Dr. **David H. Staelin**, professor of electrical engineering and computer science and assistant director of MIT Lincoln Laboratory, and Principal Research Scientist Dr. **Philip W. Rosenkranz**, and also includes Research Scientist Dr. **Michael J. Schwartz**, Sponsored Research Technical Staff **John W. Barrett**, and graduate students **William J. Blackwell** and **Fred W. Chen**. Of the institutions involved in this cooperative research effort, the RLE field operation is the only one which is run mainly by graduate students. "I enjoy the collegial atmosphere and the opportunity to collaborate with scientists from NASA, NOAA, MIT Lincoln Laboratory, and the other universities," Bill Blackwell says.

In past years, the team has participated in a variety of missions worldwide. Two weeks before the team's most recent mission, CAMEX-3 (Convection and Moisture Experiment), began in August, the RLE team crated and shipped about 1200 pounds of equipment to the ER-2's home base, Dryden Field at Edwards Air Force Base in California. Mike Schwartz and Bill Blackwell traveled to Dryden where the MTS was integrated into the rear section of a wingpod on the aircraft. Jack Barrett, who has been working on this project and its predecessors since 1961, says, "The equipment must be flight tested to prove it structurally safe and compatible with the aircraft's electrical systems and with other experiments onboard."

After a successful testing period at Dryden, the ER-2 with RLE's MTS and other experiments onboard was flown to Patrick AFB in Cocoa Beach, Florida, for the series of storm overflights. At Patrick, Phil Rosenkranz, Bill, and Fred Chen took turns working on-site in August, while in September, Mike Schwartz took over on his own for three weeks. Mike remarks that the RLE team put in crazy hours, working hard to make the strict deadlines for flight readiness, often testing software through the night. Bill Blackwell says his RLE group redesigned the MTS to be easily upgradable. The new, improved instrument has more channels and collects more data with greater accuracy. Bill welcomes the challenge of working on the microwave radiometer. "Because the MTS is new," he remarks, "we have to put in long hours to ensure that it will work properly." Mike agrees, "The instrument works differently during ground tests than it does at 65,000 feet, and we have to adjust for those problems."

Top photo: Essentially a glider with an engine, the ER-2, a $30 million aircraft operated by NASA, flies at altitudes of 65,000 - 70,000 feet. A relative of the U-2 spy plane, the ER-2 is made of modules, including several special "pods" where testing equipment is housed during flight. Eight or nine experiments are flown on each mission.There are strict rules for weather conditions for take-off because the ER-2 is fragile and cannot land in crosswinds. Because of the narrow width of the aircraft, there is space for only a pilot. During the flights, which sometimes last twelve hours, the pilot sits in an extremely confined space and must wear a full-pressure suit similar to an astronaut's. (Photo by John W. Barrett) Right: William J. Blackwell (left), John W. Barrett (center), and Dr. Michael J. Schwartz in front of an ER-2 wingpod housing the RLE and companion Lincoln Laboratory experiments. Each wingpod is 28 feet long and 30 inches in diameter. (Photo by Ann I. Barrett)

Preparing for actual flights was very demanding. Three and a half hours before flight time, which was often at 5 or 6 AM, the RLE team was given access to the plane for one and one-half hours; then they backed off while the crew checked vital data for the next two hours.

For the CAMEX-3 mission in August and September, there were flights over Hurricanes Bonnie and Earl. On September 24, 1998, because Hurricane Georges was predicted to hit Florida, NASA evacuated the ER-2 to Warner Robbins AFB in southern Georgia.

The next series of flights is planned for the spring 1999 in Wisconsin, as part of an experiment on mid-latitude storms.

Inspired by "Hurricane Study Could Save Lives and Property," Tech Talk, *August 26, 1998.*

***RLE** is blessed with a number of staff members who pursue creative lives outside the office. Particularly plentiful are musicians. For this issue of **undercurrents**, we decided to check in with some of our musical folks to see what they've been up to, both lately and in the past.*

Felicia G. Brady is an administrative assistant in RLE's Remote Sensing and Estimation group. She has been playing piano since she was three years old when her mother, a piano teacher, gave her pointers each day after her students had left. She stuck with it and majored in piano in college, where she began writing songs. She later formed a band, Tulia Mirage, in which she sang and played accordion and guitar. When the band ultimately broke up, Felicia decided to pursue solo performing. She began performing a great deal, singing her songs and playing guitar. She continues to write songs–one of which will appear in an upcoming feature film, *Land Fall*–and is currently planning to record a CD. All the while, Felicia has been teaching piano and both playing organ and directing a church choir. She enjoys her work with the church, finding the combination of music and spirituality energizing.

Francis M. Doughty, administrative assistant to RLE Professor Donald Troxel, has been playing acoustic guitar for around 25 years, since the age of 17. He earned his bachelor's degree in music at UMass, studying classical composition. He credits his grounding in the classical tradition for his sense of musical structure. Less than two years ago, Fran began his current regime of performing once or more each month at restaurants, cafés, and private parties. His performances present a mix of his own instrumental compositions along with covers of pieces by Kottke, Fahey, and Gerhard along with some traditional, jazz, and slide guitar pieces. This year he has been recording his music. His debut CD, *Among Trees*, is now available. It contains thirteen original compositions performed on acoustic, steel-string guitar in a style sometimes called "adult contemporary folk" music. For information, you can contact him at 978-544-5450, at doughty@mit.edu, or check his web page at http://www-mtl.mit.edu/~doughty/.

Angela "Chi-chi" Glass is an assistant to Professor Coppi in RLE's Plasma Physics group. An undergraduate at the New England Conservatory of Music, Chi-chi has studied classical piano since age five. This fall she made the switch to jazz, citing a different style of mentorship as a primary reason. In jazz, composition is not easily separated from performance, and the study of jazz playing tends to be tailored to developing one's own distinctive musical style. Chi-chi's roots in Latino music drive her interest in jazz, which focuses not so much on piano as on vocals. Her heroes of jazz are the great vocalists–Carmen McRae, Billie Holiday, Abby Lincoln–and she sees her role as a pianist defined by playing to the vocalist. This year, she will be studying voice as well as piano and has plans to start a salsa band.

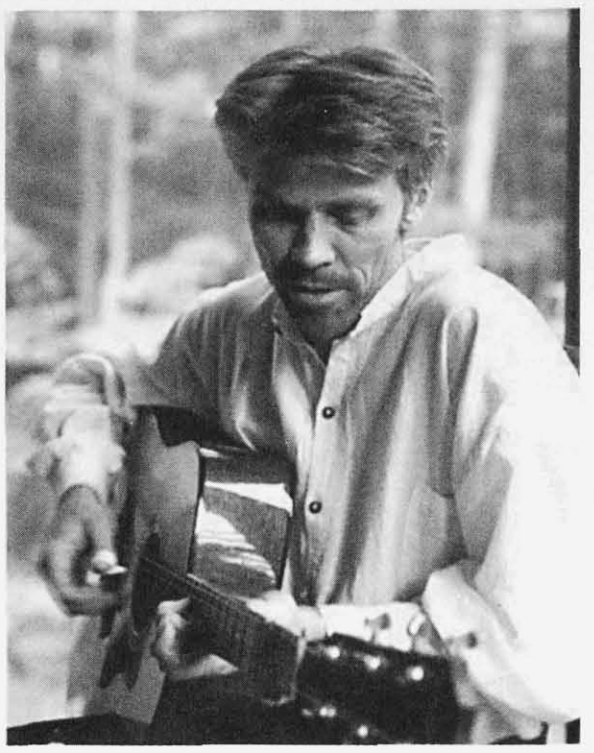
Rose M. Rizzo is assistant fiscal officer in RLE Headquarters' Fiscal group. Rose has always loved to sing. She sang in her high school choir and in college joined a church choir, where she sang for a number of years. During her time at the church choir, Rose drew on her training as an elementary school teacher to direct a number of youth musical productions. Most recently, she traveled with a community choir to Scotland where they performed several concerts.

Jonah Sacks is editorial assistant in RLE Headquarters' Communications group. Jonah has played cello since age five. He studied classical music, but did not escape the influence of jazz and blues from his father, who had been a jazz saxophonist. At age 15, Jonah began to play guitar and completed the switch to rock music in college. Several years ago, he began to experiment with cello as a rock instrument. Now he plays cello in two bands, the Steve Walther Orchestra and Bourbon Princess. Jonah also writes music, both songs and instrumental pieces, which he records using whatever instruments he can get his hands on. For information about upcoming performances, please email Jonah at jsacks@rle.mit.edu.

Barbara Smith is a technical administrative secretary to Dr. F. Thomas Korsmeyer in RLE's Circuits and Systems group. Barbara has had music in her life from the beginning. Her mother, Edna Smith, was a classical concert pianist who performed at Carnegie Hall in the 1920s. Barbara favored theatrical performance, studying dance, voice, and acting from age eight and eventually attended Hartford Conservatory of Music for voice and theater. When she was in her thirties, a voice teacher insisted on developing her operatic voice, which blossomed into a powerful dramatic soprano. Rather than joining an opera company, Barbara opted for the creative freedom of solo performance, performing favorite arias and songs to community audiences. In 1982, she began singing the weekly novena service at the Basilica on Mission Hill in Boston. This service was broadcast nationally on Christian radio and television stations. In 1987, Barbara released an album of Christian music titled *Catch the Spirit*, which was distributed worldwide. She now teaches beginning voice, effective speaking, and phonics. Barbara performs in musicals "here and there."

Jennell C. Vick, research specialist in RLE's Speech Communication group, started singing as a young child. At age 12 she began voice lessons, which she continued throughout high school, singing in church and school choirs. In high school, Jennell was a member of the Ohio State Fair Choir, spending three weeks housed at the state fair site with 300 choir members and performing up to ten shows a day for up to 10,000 people. At the end of the fair, the choir sang their appreciation to the buyers of the winning items, singing, "We love you Foodtown" at the sale of the winning beef cow. More recently, Jennell has been a part of the Somerville Community Chorus, which performed a series of works by Somerville composers, including *Flower of Dharma*, a Buddhist cantata by Richard St. Clair, which Jennell says is the most challenging piece of music she has sung. (See *Short Waves* in next column for news about Jennell's recent marriage.)

Janice Zaganjori is senior office assistant with Professor Gregory W. Wornell in RLE's Digital Signal Processing group. Janice works mornings at RLE and teaches piano in the afternoons. She has 18 students, ages 6 to 15, who study classical or pop music, or "whatever keeps them interested." She arranges two recitals each year for her students, one in December and one in the spring.



Administrative Assistant Francis M. Doughty doing one of the things he enjoys the most–playing his guitar. (Photo by Steve Daly)

Janice comes from a family of pianists. She has a sister who composes and sings and two brothers who form a concert piano duo, the Paratore Brothers, performing mainly in Europe. Janice is an active member of the Middlesex Musical Arts Society in Arlington.

Short WWWWWWWaves

Yonina Eldar, a graduate student in the Digital Signal Processing group, and her husband Shalom, are the parents of a son Yonatan who was born on July 4, 1998.

Michael H. Lim, graduate student in the Quantum-Effect Devices group, and Stella Park were married on September 5, 1998, in Pasadena, CA. Mike works on the fabrication of grating-based filters for optical communication systems.

Maintenance Mechanic **Albert T. McGurl** coached the Wakefield Warriors, a Pop Warner football team, through an undefeated season this fall, a first for a Wakefield team.The Warriors topped the Middlesex division and advanced to the playoffs, where they lost to Cambridge, the winner in the Greater Boston division.

Al's daughter **Kaitlyn** also participated in the football season, heading the Wakefield Warriors' cheerleading squad. Kaitlyn's leadership brought the squad a win in the Middlesex division cheerleading competition, also the first win for a Wakefield cheerleading squad. *(Photo courtesy Albert T. McGurl)*

Research Specialist **Jennell C. Vick** married John Nikolai Costalas on October 31, 1998, in Toledo, Ohio. After a formal wedding, the couple hosted a Halloween masquerade party. Jennell and John, a librarian in the Astronomy Department at Boston University, reside in Allston.