

AMES LAB INSIDER



Distinguished Postdoctoral Fellow Studies Carcinogens

Glenn Alan Marsch plans to spend the next two years at Ames Laboratory studying the way chemical carcinogens damage DNA (genetic material). Using a new spectroscopic method, he is trying to understand the structural aspects of DNA damage that occur when certain chemicals produced by such things as burning fossil fuels and cigarette smoke bind to DNA and cause cancer.

Marsch received an Alexander Hollaender Distinguished Postdoctoral Fellowship, awarded by DOE's Office of Health and Environmental Research (OHER) in memory of the late Dr. Alexander Hollaender, the 1983 recipient of DOE's prestigious Enrico Fermi Award. Hollaender's research efforts were instrumental in making DOE's biomedical research programs among the most prominent in the world. One of OHER's goals is to significantly improve understanding of the early stages of chemical carcinogenesis caused by energy-related pollutants.

Receiving this fellowship is a significant honor since DOE awards a maximum of ten each year for all biomedical fields. Marsch joined Senior Chemist Gerald Small's group last July. He says he chose Ames Laboratory because of the versatility of the Laboratory's research programs, the reputation and

track record of its scientists, and the research opportunities it offers.

"The emphasis of my research is to understand the different ways a chemical can bind to DNA and what the



Glenn Marsch

biological activity of each type of binding is," explains Marsch. "I have investigated the covalent interactions of small molecules with DNA in order to explain their sequence preferences. We also plan to construct synthetic DNA based on sequence preferences."

Once certain chemicals bind to DNA, they can induce mutations or changes in the genetic code, and can activate genes that cause cancer. However, not all the chemicals that bind to DNA cause cancer. Some are harmless, while a subset is highly dangerous.

One chemical Marsch is studying now seems to have been the culprit when a cancer epidemic broke out among chimney sweeps

during Victorian times. Marsch says we now know that the chimney sweeps were exposed to benzo[a]pyrene, a chemical responsible for many types of tumors. Benzo[a]pyrene is produced mostly by burning fossil fuels, but is also found in cigarette smoke. Our bodies absorb this chemical (which itself is harmless) and change it to dangerous by-products. Two of these benzo[a]pyrene by-products that Marsch is studying are the almost identical chemical compounds, anti-(+)benzo[a]pyrene diol epoxide (BPDE) and anti(-)-BPDE. Interestingly, anti-(+)-BPDE is highly carcinogenic, while anti(-)-BPDE is not carcinogenic.

A key objective of Marsch's research is to identify the anti-(+)-BPDE-DNA lesions that are responsible for carcinogenesis in order to develop a hypothesis of why they are not properly corrected by cellular DNA repair mechanisms. Marsch also wants to establish why anti(-)-BPDE is relatively less harmful than its sibling, anti-(+)-BPDE.

Another chemical Marsch has investigated is the anti-tumor agent actinomycin D. He's also interested in Aflatoxin B1, a natural carcinogen found in mold growing on peanuts, particularly in Africa.

Most studies of chemical carcinogenesis involve extremely high concentrations of carcinogens, above the levels normally found in living organisms. Joint research by Small, and Ryszard Jankowiak, chemist, have shown that laser-induced fluorescence line narrowing spectroscopy (FLNS) possesses the resolution and sensitivity required

for detailed *in vivo* analysis of carcinogen-DNA adducts.

In addition to the work done by Small's group in this area, the Ames Laboratory is a leading facility for research on high resolution and high sensitivity analyses of macromolecular DNA and globin damage. "Small is a highly respected scientist in laser spectroscopy and I can learn a lot from him," Marsch says. "My joining Small's group adds a biochemical dimension to his program, since I have expertise both in DNA chemistry and in oligonucleotide preparation and purification. At the same time I can expand my knowledge in the technique of FLNS which I intend to use in the future. By coming to Ames Lab, I also have the opportunity to learn more about physics so that I can apply it to solving problems in biology."

In April of this year, Marsch earned his Ph.D. in molecular biophysics from the Institute of Molecular Biophysics at Florida State University in Tallahassee. He has received several other awards including one from Phi Kappa Phi National Honor Society.

His ultimate career goal is not only to do excellent science, but also to train and inspire young scientists.

Marsch and his wife, a fourth generation Floridian, and their two-year-old daughter are looking forward to their first winter in Iowa. "It will be a nice change from the sticky heat and humidity of Florida," he says with a naive smile.

A Keynote Individual

It seems that some things are always a part of the childhood years, regardless of what year it was that you were a child. An enduring constant of that carefree time is the experience of taking piano lessons, through which many of us struggled and a few succeeded. One successful person at the Ames Laboratory is Marilyn Forsling. With her office located at the end of the hall just beyond the vending machines in Spedding, many of you have seen her, some more often than others. In addition to keeping the 8 to 5 lives of a number of researchers more orderly and harmonious, Marilyn is an accomplished musician.

Music became a part of Marilyn's life at age seven in Odebolt, IA when she started taking piano lessons. Undoubtedly, she had some idea even at that age that music would become her lifelong companion. Her enjoyment of it helped overcome the apprehensiveness which accompanied her visits to Justina, the piano teacher who Marilyn claims "was at least a hundred years old at the time!"

Marilyn's interest in music continued and grew through her school years. She began taking voice lessons in high school and competed as a soloist in contests throughout the state. She played trombone in the band and sang in a variety of small group ensembles.

After high school, Marilyn

attended Morningside College as a music major with an emphasis in voice. She sang with a jazz band that played in a few of the local clubs. "We thought we were pretty cool," Marilyn recalled. At one point in her college career, Marilyn decided to try the guitar, the all important instrument of the 60's. "I took a guitar seminar," she grinned, "but it didn't take!"

Following college, Marilyn taught junior high English and elementary music in Story City. A few years later, when she had her own young family, Marilyn began giving private piano lessons at home. She soon discovered she much preferred the one-on-one teaching relationship to classroom teaching. Today she is once again giving piano lessons, sharing her talent and knowledge with six students, four children and two adults, including the author of this story, Saren Johnston.

So what kind of music does a music teacher like? Marilyn

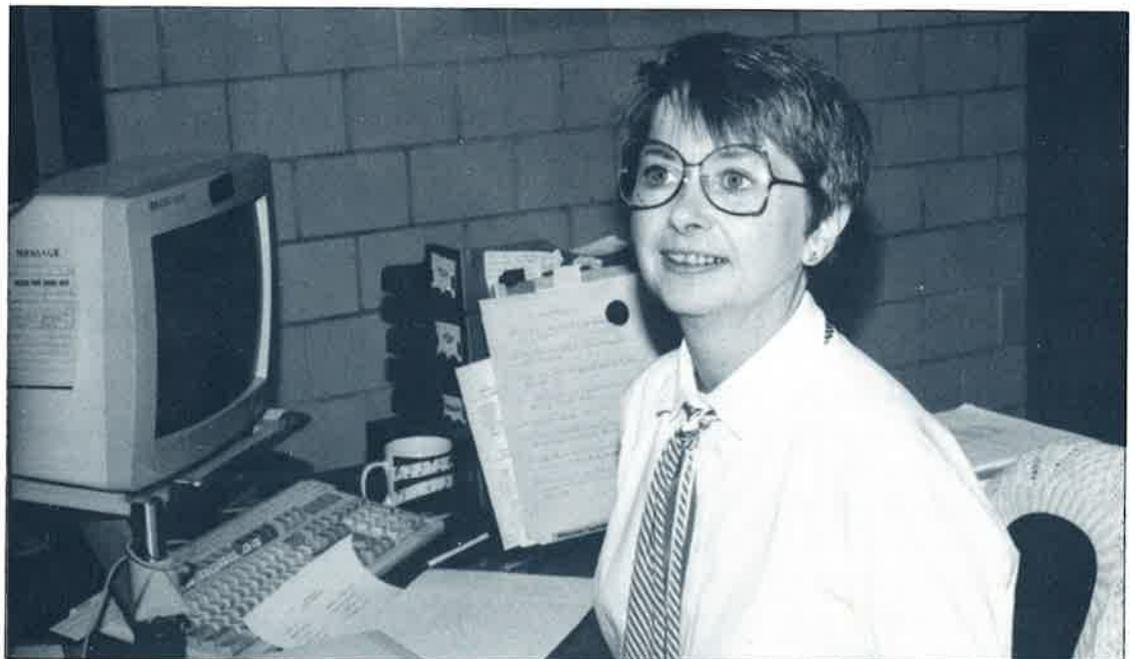


Marilyn enjoys some tranquil moments.

thinks rap is fun and she loves jazz, but her favorite music is that of the composers of the romantic period, among whom are Puccini and Brahms.

Asked about future musical plans, Marilyn says she is uncertain. Once her son graduates from high school,

she may consider joining a community vocal group, but for now music is a facet of Marilyn's life that she cherishes for the enjoyment it brings her. She is comfortable with it and treasures it like an old friend. □



Marilyn provides a harmonious office atmosphere.

A Tradition in Dining

This December some tempting and inviting smells will make their way through the corridors of Spedding Hall, harbingers of the dining event to come, the annual First Floor Christmas Party.

Now in its eighth year, the festivity began in 1983. In that first year the party was small, involving only Personnel, Budget, and Safety Health and Plant Protection. Over the years, the holiday event grew to include all of the first floor of Spedding, the Office of Information, Graphics and the Computer Garage.

Committee members begin planning the party around Thanksgiving, dividing up tasks such as purchasing supplies, routing a sign-up sheet, collecting money, and sending invitations. This year's committee members are Jack Cummings, Marilyn Forsling, Ila Haugen, Rhonda Hill, Saren Johnston, Diane Meyer, Ellen Price and Dave Seuferer.

By now a tradition, the annual celebration is popular among attendees for the many and varied buffet selections

contributed and shared. In the spirit of the season, the buffet is usually left up throughout the afternoon for other employees in Spedding to enjoy the remaining dishes and desserts. Enhanced by the superb chili carefully prepared by Paul Millis and the lively accordion music supplied by Pat Emley, the party is always a huge success! □



Paul Millis (left) serves his chili to Lowell Mathison.



John Davis and others make their selections from a traditional holiday buffet.



Pat Emley dishes up some lively accordion music as Beth Lott (left), Diane Drake and Ellen Price look on.

Ames Lab Carolers

Each December for the past several years, a small but hardy group of Ames Lab employees has ventured forth in song to carol others, bring them cheer, and wish them well during the holiday season. Meeting in one of their homes, the carolers hold

a thirty to forty-five minute practice before setting out for the evening. Effortlessly they breeze through such familiar favorites as "Jingle Bells" and "Joy To The World"; hopelessly they struggle to make "O Holy Night" sound that way!

Impassively withstanding numb toes, frozen fingers and

runny noses, hurriedly flipping pages of music to find unfamiliar third-verse words to a song, and silently cursing the "ever-ready" batteries that just failed in the only flashlight, the carolers persist in bringing the spirit of the season into the homes of fellow Ames Lab employees and retirees. Some past gracious recipients of song include Del Bluhm, Dianne

Borgen, Burt Gleason, Bob Hansen, Tom Kelly, Mike Murtha, Denny Sailsbury, Milo Voss, Harley Wilhelm and the swing-shift guards in Spedding Hall.

Nourished and warmed by food and drink at each stop, encouraged by smiles, laughter and comradery, the carolers sing "just one more song." Standing in a friend's doorway under the warm glow

of the porch light, there is only peace and love all around. (Anyone wishing to join the Ames Lab Carolers in future holiday seasons should contact Saren Johnston at 4-3474 or Mike Marti at 4-6011.) □

Many holiday celebrations take place at the Ames Lab. The staff of the INSIDER would like to feature others in the future. Planning stories of a seasonal nature means taking photos now. Please notify Dianne Borgen at 4-5635 or Saren Johnston at 4-3474 regarding your scheduled holiday functions so that photos may be taken in preparation for next year. Thank you.



Ames Lab carolers Saren Johnston, Beth Harvey, Gene Pedersen, Bill Buttermore, Mike and Chris Marti sing in Spedding.

December Memories

This year the Ames Lab carolers were out on December 5 bringing cheer and creating memories like those related in the following tale from December of 1989.

Twas several nights before Christmas, oh, twenty or so
When we sprang to our cars a caroling to go.

First stop was the Gleason's;
Burt and Bobbie were great.
They recorded us all on a video tape,
Then invited us in for some drinks to partake.

We moved on to the Lab—what could we do here?
We'll carol the guards with our holiday cheer!
The guards were impressed; they gave us the mike,
And the Lab came alive with our voices so bright!
A few researchers came out and joined in the singing;
We left the dear Lab with Jingle Bells ringing!

On to Del Bluhm's to spread more holiday cheer,
But Del was not home, oh my and oh dear.
Too bad that you missed us, but count on next year!

Dianne Borgen was next in our stops for the night,
At her back door we huddled beneath the porch light.

As we sang by her window, a small face we did see...
Dianne's grandson, Nick, with eyes big as could be!
A little bit frightened of our curious group,
He clung to her side as in we did troop.
We sang festive songs about Santa and such,
But he never quite trusted us really too much.
Can't say that I blame him, we were quite a sight
As we stood towering there in the warm kitchen light.

Denny Sailsbury's house was the next to last stop,
So we hurried on down to the Roosevelt block.
Another video tape—good grief, we're just great;
Perhaps entertainment is our ultimate fate!

Last stop for the evening was the home of Tom Kelly,
Who whisked out the drinks to put warmth in each belly.
We listened to Tom, you could do nothing less,
As he told us grand stories, some of his best!
There's no one like Tom who can keep your heart merry,
His tales were so fun we continued to tarry.
It was eleven o'clock when we left for the night,
Wished Tom Happy Holidays and slipped out of sight.

We were tired and quite sleepy, it was definitely true,
So off to our homes we carolers flew.
But with lots of good memories to inspire us anew,
It's likely next year we'll be caroling you! □

Saren Johnston



Season's Greetings

Beginning in January, charges for literature searches on the Chemical Abstracts Academic Program will be discounted by 80% instead of 85%. This is still a significant savings and an excellent opportunity to economically access scientific information electronically.

The Lab's new science publication, INQUIRY, will debut in January. Published quarterly, the magazine is designed to communicate Laboratory research to an external audience. If you have ideas or suggestions for this publication, please send your comments to Pattye Volz, Editor, or call her at 4-5643.

The worst blizzard in five years hit Ames on December 3 with strong winds and heavy snow closing the University. WHEN THE UNIVERSITY CLOSES DUE TO BAD WEATHER, THE AMES LABORATORY WILL ALSO CLOSE.

The December 1991 issue of the INSIDER will feature outdoor holiday lighting. If you are an outdoor decorator, or know of a co-worker who is, please call Dianne Borgen, 4-5635 or Saren Johnston, 4-3474 so photos can be taken this year.

COMPUTER SECURITY

More on our discussion of sensitive and mission-essential data. Ames Laboratory is required by DOE Order to protect sensitive and mission-essential data by ensuring integrity, availability, and confidentiality.

NATIONAL SECURITY RELATED (UNCLASSIFIED)

- Unclassified information which, alone or in the aggregate, reveals information regarding a high-value U.S. program or initiative. Examples are:

- International traffic in arms control
- Unclassified intelligence information
- Controlled scientific and technical information
 - Nuclear non-proliferation act related
 - Naval nuclear reactor program related
 - Strategic defense initiative related
 - Military critical technologies list

- Foreign exchange information

DOE SECURITY OR MISSION RELATED - Unclassified information developed and stored to administer and ensure compliance with DOE security programs. Examples are:

- Life essential
- Mission essential
- Irrecoverable information
- Limited access information
- Security/internal audit information
- Investigation/law information
- Legal information
- Audit information
- Contract and proprietary information
- Automated decision-making information

PROTECT AS RESTRICTED DATA - An ADP document that may contain classified information that is not readily recognized as classified or unclassified; operational conditions resulting from large volumes of documents that preclude

utilization of certain security measures applicable to classified information; an ADP document that contains a low density of potentially classified information. Examples are:

- DOE nuclear weapons program computations
- Weapon code programming statements excluding documentation of the program, explanatory notes, and similar clear text material associated with a weapons code.

GOVERNMENT COMMERCIAL CONFIDENTIAL INFORMATION

- Sensitive commercial information not including restricted data, generated by the government, the release of which could put the government at a competitive disadvantage in providing enrichment services.

Examples are:

- Program-specific information
- R&D breakthroughs
- Patentable information

We can use this information and apply them at Ames Laboratory by training

Laboratory personnel. ALL employees should understand the definitions of sensitivity and essential information, and know the sensitivity of the data they handle and essentiality of applications supporting DOE mission-essential functions.

DATA OWNERS - The responsibilities of designated individuals should be identified. Data owners need to know how to define functional security requirements that are based on established site procedures. This includes determining the nature of the sensitivity, how the application/information may be vulnerable, and potential impacts if sensitive information is misused, altered, destroyed, or disclosed. These and other topics will be addressed by the Ames Laboratory computer security and awareness training program. For more information please contact Frank Carlsen. □

Student Associate Wins Amoco Fellowship

The Amoco Foundation is honoring Ames Laboratory student associate Oden Warren with a 1990 Amoco Fellowship in chemistry. This corporate fellowship provides a year's tuition and fees for Warren, a doctoral candidate in Materials Chemistry since the fall of 1988.

"It was a pleasant surprise when I saw the announcement that I had been named an Amoco Fellow," Warren says

with a smile. His surprise is understandable since he did not apply for the fellowship and is not sure who nominated him.

In addition to providing financial support, Warren noted the Fellowship should help him find a better job in the future.

Warren conducts basic research in low-energy electronic diffraction, a branch of surface chemistry studying the structure of layers.

"I grew up in a rural Ohio



Oden Warren

farming community, and Iowa is not much different than

home," he says. "I like it here." □

DePristo Elected Fellow in American Physical Society

The American Physical Society recently recognized Andrew DePristo, director of the Fundamental Interactions Program, by electing him to Fellowship in the Society at its October meeting in Urbana, Illinois. Notified of this honor, DePristo expressed that he was quite pleased to be nominated and elected by his colleagues. According to his Fellowship Certificate, DePristo is being honored for "outstanding contributions in elucidating the quantum state dependence of energy transfer in molecular collisions and developing the corrected-effective-medium method for studying chemical bonding in

metallic clusters."

His name and citation, along with those of others elected to Fellowship, will be published in the February 1991 *Bulletin of the American Physical Society*.

Asked about the two areas of research mentioned in the citation, DePristo commented that the work on energy transfer in molecular collisions, done between 1977 and 1984 while at Princeton, the University of North Carolina and Iowa State University, was "a good piece of work that has practical importance and is quite useful." However, he emphasized, "The more recent research, resulting in the corrected-effective-medium method, is much

more fundamentally important."

DePristo's development of this computer method for studying the chemical bonding in metal clusters may open the door to materials by



Andrew DePristo

design. "The corrected-effective-medium method offers a new way to look at bonding in metals that is much more efficient computationally than previous methods," DePristo explains.

"Computer-assisted design of materials can be very functional; materials can be mixed and the effect observed, all on the computer screen."

DePristo came to Iowa State University in 1982 and was an associate of the Lab before becoming director of the Fundamental Interactions Program in 1989. He has high praise for the Ames Lab asserting, "The Lab is terrific! Working here makes a world of difference in collaborative endeavors." □

➤ **MARSCH** / Continued from Page 2

A person with many interests, Marsch has studied German and Latin, and is an avid reader of Greek and Latin classics (written in English) and Christian theology. His hobbies also include raising tropical plants such as orchids and keeping salt-water tropical fish. □

1990 Fassel Lecture



Richard F. Browner from the Department of Chemistry, Georgia Institute of Technology, (left) delivered the 1990 V. A. Fassel Lectures this fall. Held in honor of Fassel (right), deputy director of Ames Laboratory from 1969 to 1983, the lectures recognize his contributions to analytical chemistry and spectroscopy.

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Address comments to:
Editor, *INSIDER*
201 Spedding Hall
Ames, IA 50011-3020
515/294-1856

Dianne Borgen	Editor
Saren Johnston	Writer
Avinash Pancholi	Graduate Assistant
Chris Fullhart	Layout Artist
Dennis Sailsbury	Photographer

Address correction requested
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