RECOMB '97

The First Annual International Conference on Computational Molecular Biology

January 20 – 23, 1997
Santa Fe, New Mexico

Sponsored by
Association for Computing Machinery
with support from
SLOAN Foundation and
US Department of Energy

Registration for RECOMB '97

The registration fees for RECOMB '97 are listed below. To qualify for the early registration fee, your registration application must be postmarked by **Friday, December 20**. Refund requests will be honored until January 4. The non-student registration fee includes the Sunday night reception, the Tuesday night banquet, coffee breaks and lunches, and a copy of the proceedings. The student fee includes all of the above except the banquet. Please fill out the form below and send it, along with a check or money order (in US $, drawn on a US bank) made payable to "RECOMB '97," to:

Sorin Istrail
Attn: RECOMB registration
Sandia National Laboratories
Department 9222, Mail Stop 1110
Albuquerque, NM 87185-1110

Name________________________
I would like my name tag to read____________
Affiliation________________________
Street Address______________________
City____________State____________
ZIP or Country & Postal code____________
Country________________________
Citizenship________________________
E-mail________________________
Phone________________________
Fax________________________

Please circle one category below and fill in your membership number if appropriate: #____________

Category	**Fee**	**After 12/20**
ACM	285	360
Other	360	435
Student	160	210

Extra Banquet Tickets ____ $\times$\$50 each = ____________
Total registration ________________________

Dietary restrictions: Kosher____Vegetarian____None____

Special needs (attach letter if necessary) ____________

Hotel Reservations

The conference will be held at the Eldorado Hotel in Santa Fe. The rates for IEEE RECOMB '97 are posted below and apply from Sunday, January 19 through Saturday, January 25, pre and post days on a space available basis. Checkin time is 4:00 p.m. and checkout is 11:30 a.m. Please advise the hotel of late arrival. Santa Fe is a popular destination; please call soon. Refer to IEEE RECOMB '97 when making reservations to obtain the rates listed.

To make your reservations by phone, call 1-800-955-4455 or 505-988-4455 or fax 505-995-4544. To make reservations by mail or fax, fill out the form below and send it to the address below. A deposit in the form of a check or money order for one night's stay, or credit card information and your return phone and/or fax must be included. When filling out the form, make sure that you list your name exactly as it appears on your check or credit card. The following credit cards are accepted: American Express, Diners Club, Visa, Mastercard, and Discover. Deposits will be refunded if the hotel is notified at least 72 hours before your specified arrival.

Eldorado Hotel
Attn: IEEE RECOMB '97 Reservations
309 West San Francisco
Santa Fe, NM 87501

Please check one:

Single $85 ________________________

Arrival Date: __________ Departure Date: __________

Please fill out:

Name________________________

Address________________________

____

Fax:______________ Phone______________

Sharing room with________________________

If paying for deposit by credit card please complete:

Credit Card Type________________________

Credit Card Number________________________

Expiration Date________________________

I authorize Eldorado Hotel to charge the above account for the amount equal to one night's stay as deposit.

Signature________________________

SUNDAY, JANUARY 19, 1997
Reception: 7 pm–10 pm, Eldorado Hotel, Anasazi South

MONDAY, JANUARY 20, 1997

9:00 am– 5:00 pm Poster Session, Zia B&C

General Seesion, Anasazi Ballroom

8:45 Opening Remarks:
Michael Waterman, General RECOMB Chair
1997 Program Committee Chair
Sorin Istrail, General RECOMB Vice-Chair
1997 Conference Chair
Pavel Pevzner, General RECOMB Chair
1998 Program Committee Chair

Distinguished Conference Lecture: 9:00 – 10:00
Chair: P. Pevzner

Hunting for New Restriction Enzymes in GeneBank *Rich Roberts*

Break: 10:00 am – 10:15 am

Session on Mapping – chair P. Green

10:15 *An Algorithm for Haplotype Analysis:* Shili Lin, Terence P. Speed

10:40 *Building Human Genome Maps with Radiation Hybrids:* Donna Slonim, L. Kruglyak, L. Stein, E. Lander

Break: 11:05 am – 11:15 am

Session on Genomic Rearrangements – chair R. Karp

11:15 *Faster and Simpler Algorithm for Sorting Signed Permutations by Reversals:* Haim Kaplan, Ron Shamir, Robert Tarjan

11:40 *Conserved Segment Identification:* David Sankoff, V. Ferretti, Joe Nadeau

Lunch: 12:05 am – 1:30 pm, Eldorado Court

Invited Lecture Session: 1:30 – 2:30
Chair: P. Pevzner

DNA Probe Arrays – Accessing the Genome *Rob Lipshutz*

Break: 2:30 pm – 2:45 pm

Session on New Technologies– chair G. Myers

2:45 *Fabricating Arrays of Strings:* J. Richard Bradley, Steven Skiena

3:10 *An Algorithmic Approach to Multiple Complete Digest Mapping:* Dan Fasulo, Tao Jiang, Richard M. Karp, R. Settergren, E. C. Thayer

3:45 *A Highly Effective Simple Combinatorial Approach for Constructing Physical Maps by Optical Mapping:* S. Muthukrishnan, Laxmi Parida

Break: 4:10 pm – 4:25 pm

Invited Lecture Session: 4:25 – 5:25
Chair: S. Karlin

Variations on a Theme of Lander and Waterman *Terry Speed*

Buisiness Meeting, Anasazi Ballroom: 8:00 – 10:00

TUESDAY, JANUARY 21, 1997

9:00 am– 5:00 pm Poster Session, Zia B&C

General Session, Anasazi Ballroom

Invited Lecture Session: 8:30 – 9:30
Chair: R. Roberts

Expression Arrays: An Open Problem for Mathematicians in Post-Genome Sequence Biology *David Botstein*

Break: 9:30 am – 9:45 am

Session on Sequence Alignment – chair S. Altschul

9:45 *Progressive Multiple Alignment with Constraints:* Gene Myers, Sanford Selznick, Zheng Zhang, Webb Miller

10:10 *Chimeric Alignment by Dynamic Programing: Algorithm and Biological Uses:* George A. Komatsoulis, Michael Waterman

Break: 10:35 am – 10:45 am

Session on Sequence Alignment – chair T. Smith

10:45 *Sequence Alignment with Tandem Duplication:* Gary Benson

11:10 *A Branch-and-Cut Algorithm for Multiple Sequence Alignment:* K. Reinert, Hans-Peter Lenhof, P. Mutzel, K. Mehlhorn, J. D. Kececioglu

11:35 *Fast and Numerically Stable Parametric Alignment of Biosequences:* Ralf Zimmer, Tom Lengauer

Lunch: 12:00 am – 1:30 pm, Eldorado Court

Invited Lecture Session: 1:30 – 2:30
Chair: M. Waterman

Assesing Inhomogeneities in Bacterial Long Genomic Sequences *Sam Karlin*

Break: 2:30 pm – 2:45 pm

Session on Gene Recognition – chair G. Stormo

2:45 *Reference-based Gene Model Prediction on DNA Contigs:* Ying Xu, Edward Uberbacher

3:10 *Las Vegas Algorithms for Gene Recognition: Suboptimal and Error-Tolerant Spliced Alignment:* Sing-Hoi Sze, Pavel Pevzner

Break: 3:35 pm – 4:45 pm

Session on Protein Folding – chair M. Karplus

3:45 *Protein Structure Prediction and Potential Energy Landscape Analysis using Continuous Global Minimization:* Ken Dill, Andrew T. Phillips, J. Ben Rosen

4:10 *Lattice and Off-Lattice Side Chain Models of Protein Folding: Linear Time Structure Prediction Better than 86% of Optimal:* William E. Hart, Sorin Istrail

Break: 4:35 pm – 4:45 pm

Invited Lecture Session: 4:45 – 5:45
Chair: M. Karplus

The Threading Approach to the Inverse Protein Folding Problem *Temple Smith*

Cocktails, Anasazi Ballroom: 7:00 pm

Banquet/RECOMB Fiesta, Anasazi Ballroom: 7:30 – 10:00

Stanislaw Ulam
Computational Biology Address: 7:30 – 8:30
Chair: M. Waterman

The Human Genome and Beyond *Eric Lander*

WEDNESDAY, JANUARY 22, 1997

9:00 am– 5:00 pm Poster Session, Zia B&C

General Session, Anasazi Ballroom

Invited Lecture Session: 8:30 – 9:30
Chair: S. Istrail

Protein Dynamics: From the Native to the Unfolded State and Back Again *Martin Karplus*

Break: 9:30 am – 9:45 am

Session on Protein Folding – B. Berger

9:45 *On the Computational Complexity of Sequence Design Problems:* William Hart

10:10 *On the Approximation of Protein Threading:* Tatsuya Akutsu, S. Miyano

Break: 10:35 am – 10:55 am

Session on Mapping – chair R. Shamir

10:55 *On Constructing Radiation Hybrid Maps:* Amir Ben-Dor, Benny Chor

11:20 *Pooling Strategies for Establishing Physical Genome Maps Using FISH:* Fengzhu Sun, Gary Benson, Michael Waterman

11:45 *Algorithm for Computing and Integrating Physical Maps Using Unique Probes:* Mutida Jain, Gene Myers

Lunch: 12:10 am – 1:30 pm, Eldorado Court

Invited Lecture Session: 1:30 – 2:30
Chair: S. Istrail

Problems in Understanding the Structure and Assembly of Viruses *Jonathan King*

Break: 2:30 am – 2:45 am

Session on Protein Folding – chair B. Berger

2:45 *Local Rules for Protein Folding on Triangular Lattice and Generalized Hydrophobicity in the HP Model:* Richa Agarwala, Serafim Batzogloa, V. Dancik, Scott E. Decatur, M. Farach, S. Hannenhalli, S. Muthukrishnan, S. Skiena

3:10 *New Contact Measures for the Protein Docking Problem:* Hans-Peter Lenhof

Break: 3:35 am – 10:45 am

Session on Proteins – chair T. Lengauer

3:45 *An Iterative Method for Improved Protein Structural Motif Recognition:* Bonnie Berger, Mona Singh

4:10 *Chain Growth Algorithms for HP-Type Lattice Proteins:* Erich Bornberg-Bauer

4:35 *Supervised Learning of Hidden Markov Models for Sequence Discrimination:* Hiroshi Mamitsuka

Poster Session Presentations, Zia B&C 7–9pm

THURSDAY, JANUARY 23, 1997

General Session, Sweeney Convention Center

Session on Sequence Alignment – M. Farach

8:30 *Aligning a DNA Sequence with a Protein Sequence:* Zheng Zhang, William R. Pearson, Webb Miller

8:55 *ReAligner: A Program for Refining DNA Sequence Multi-Alignments:* Eric L. Anson, Gene Myers

9:20 *A More Efficient Approximation Scheme for Tree Alignment:* Lusheng Wang, Tao Jiang, Dan Gasfield

Break: 9:45 am – 9:55 am

Session on Genomic Rearrangements – chair D. Sankoff

9:55 *On the Complexity and Approximation of Syntenic Distance:* B. DasGupta, T. Jiang, S. Kannan, M. Li, Z. Sweekyk

10:10 *Sorting by Reversals is Difficult:* Alberto Caprara

Break: 10:45 am – 10:55 am

Session on Statistics – chair B. Weir

10:55 *The application of Markov Monte Carlo Methods to Radiation Hybrid Mapping:* Simon Heath

11:20 *Improved Splice Site Detection in Genie:* M. G. Reese, F. H. Eeckman, D. Kulp, D. Haussler

11:45 *Monte Carlo Sequence Alignment:* Gary A. Churchill

Lunch: 12:10 am – 1:30 pm, Sweeney Convention Center

Session on Sequence Alignment – chair W. Miller

1:30 *The Deferred Path Heuristic for the Generalized Tree Alignment Problem:* Benno Schwikowski, Martin Vingron

1:55 *New Flexible Approaches for Multiple Sequence Alignment:* Tetsuo Shibuya, Hiroshi Imai

Break: 2:20 pm – 2:30 pm

Session on Mapping – chair M. Olson

2:30 *A Branch-and-cut Approach to Physical Mapping with End-probes:* T. Christof, M. Jünger, John Kececioglu, P. Mutzel, G. Reinel

2:55 *Beyond Islands: Runs in Clone-Probe Matrices:* David Wilson, David Greenberg, Cynthia Phillips

Break: 3:20 pm – 3:30 pm

Session on Evolutionary Trees and DNA Computing – chair M. Vingron

3:30 *Numerical Taxonomy on Data: Experimental Results:* Jamie Cohen, Martin Farach

3:55 *The Power of Surface-Based DNA Computing:* W. Cai, Anne Condon, R.M Corn, E Glasser, Z. Fei, T. Frutos, Z. Guo, M. G. Lagally, Q. Lui, L.M. Smith, A. Theil

4:20 *Simulating Boolean Circuits on a DNA Computer:* M. Ogihara, A. Ray

4:45 **End of program**

General Information

Location: All conference events will take place at the Eldorado Hotel in Santa Fe, New Mexico. Santa Fe is located 60 miles north of Albuquerque, site of the closest major airport. Santa Fe is the second oldest city in the United States. In 1992 it was awarded the "Top destination of the World" award from the readers of Condé Nast Traveler. Although Santa Fe was not listed as a choice on the ballot, the 24,000+ people who participated chose it by write-in. Santa Fe is an art mecca and also offers numerous outdoor activities.

Foreign Currency We recommend you exchange foreign currency for US dollars before getting to New Mexico. The Albuquerque airport has limited exchange facilities. The United New Mexico bank at the airport is open Monday-Thursday $9-3$ and Friday $9-6$ and is closed on the weekend. They exchange currency for only 9 countries. For more information call (505) 765-5267. Banks in Albuquerque are open Saturday till noon. Banks in Santa Fe cannot exchange money on the weekend. The hotel cannot exchange money.

Registration: The registration desk will the open Sunday, January 19 from 7pm to 10pm and during the conference meeting times.

Accomodations: A block of rooms has been reserved at the Eldorado hotel at an extremely favorable rate. This luxury four diamond four star hotel has many amenities, including a hot tub and pool on the roof, a new exercise atrium, a massage therapy room and saunas, live entertainment nightly, in-house restaurants (one simple, one fine), modern southwestern decor, and extras in the rooms (such as turkish-towel bathrobes). The hotel is within easy walking distance of the plaza, in the heart of the historic district of Santa Fe. The Eldorado is extremely popular, with bookings made years in advance. The conference overflow hotel is the Hilton located across the street from the Eldorado. The phone number for the Hilton is (800) 336-3676, and the fax number is (505) 986-6439.

Transportation: The closest major airport is Albuquerque International Airport. Shuttle Jack provides nonstop service between the Albuquerque airport and Santa Fe. Driving time is 70 minutes. Reservations are required to guarantee seating. Call (505) 988-2441. When traveling from Albuquerque to Santa Fe, buses depart from the terminal in front of Southwest Airlines at the ground level. When you board the bus tell the driver at which hotel you would like to be dropped off. If you have a problem, call Shuttle Jack inside the terminal or look for their representative wearing a Red Jacket in the terminal building. Departure times from Albuquerque to

Santa Fe are: 6:40 a.m., 8:35 a.m., 12:15 p.m., 1:50 p.m., 3:50 p.m., 5:30 p.m., 8:45 p.m., and 10:45 p.m. When traveling from Santa Fe to Albuquerque, buses leave from any hotel in Santa Fe with advanced confirmed reservations. Pickup time for the Eldorado and the Hilton is 5 min. prior to schedule; departure from outside the main entrance of Eldorado. For Hotel Santa Fe, pick up time is 20 min. prior to schedule; departure from outside the main entrance. When traveling from Santa Fe, if for any reason you are not picked up within 10 minutes of your scheduled time, please call Shuttle Jack immediately. Departure times from Santa Fe to Albuquerque are 4:45 a.m., 6:45 a.m., 9:00 a.m., 11:00 a.m., 1:00 p.m., 3:20 p.m., 6:00 p.m., and 8:40 p.m. You may purchase your ticket from the driver. Shuttle Jack accepts cash or Travelers Checks. The price of a ticket is $20 each way. You must pay in cash when you depart.

Airport Hotel: If you would like to stay overnight in Albuquerque, the Best Western hotel is located right next to the airport. Cost is $63 for a single and $68 for a double. Call (505) 242-7022 for reservations and information.

Driving directions: To drive from Albuquerque Airport to the Eldorado Hotel in Santa Fe:

1. Exit airport directly onto Yale Avenue
2. Left onto Gibson
3. Take Gibson to I-25 North (a right turn right after University)
4. Follow I-25 to Santa Fe exits (approximately 60 miles)
5. Exit onto St. Francis Drive
6. Take St. Francis Drive 3.2 miles to Cerillos Road where you will bear to the right
7. Make a left at the first stop light which is Guadalupe
8. Follow Guadalupe to San Francisco Street
9. Right onto San Francisco Street - The Eldorado is in that block

Parking at the Eldorado hotel costs $6.95 per day.

Climate: The weather in Santa Fe is usually pleasant, but can vary greatly at this time of year. Average daily high temperature is 58°F and average low temperature at night is 33°F. There may be snow in the nearby mountains. Santa Fe is over 7000 feet above sea level and the air is dry. Take care during outdoor activities (bring water, allow time to rest, and dress in layers).

Things to do: Santa Fe offers a unique combination of cultural events, history, archeology, and outdoor activities. A nonexhaustive list of possible things to do include: hiking, mountain biking, golf (Cochiti Lake Golf Course is one of the most scenic and difficult courses in the USA), tennis, hot air ballooning (New Mexico is one of the best places in the world for hot air ballooning), horseback riding, visit a number of pueblos, ride a steam train, visit ancient ruins, see art galleries and museums (International Museum of Folk Art, Museum of Fine Arts, Museum of Indian Arts and Cultures, Palace of the Governors, El Rancho Golondrinas (living history), The Wheelwright museum of the American Indian, Institute of American Indian Arts, Center for Contemporary Arts, Santa Fe Children's Museum, Indian Arts Research Center, to name a few), walk the plaza, shop, enjoy fine dining, theater, and concerts. Some of the pueblos and natural wonders are a good distance from Santa Fe, but all can be done in a day. If you do not have a rental car, the hotel may be able to arrange tours if there is sufficient interest. Albuquerque is only an hour away and there are also many things to do there: the Rio Grande Zoo (a litter of white tiger cubs was born in August), the Museum of Natural History, the Explora museum (hands-on for children), Albuquerque Children's Museum, the National Atomic Museum, even ice skating. Contact the local arrangement chair for more information or ask at the hotel when you arrive.

Babysitting and Recreational Activities: "Santa Fe Destinations" is a company located in the Eldorado Hotel. They provide professional services for: babysitting, airport transportation, entertainment, recreational activities, spouse programs etc. Please call Tom Williams the Director of the company for services related to your visit in Santa Fe. The number is (505) 995-4524.

Proceedings: Additional copies of the proceedings will be sold during the conference at the registration desk.

Local Arrangements Chair: Sorin Istrail, Sandia National Laboratories, Department 9223, Mail Stop 1110, Albuquerque, NM, 87185-1110. Phone: 505-845-7612. Fax: 505-845-7442, email: `scistra@cs.sandia.gov`, secretary: 505-845-3658.

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- Richard Karp (University of Washington)
- Thomas Lengauer (GMD-SCAI, Germany)
- Pavel Pevzner, General RECOMB Chair (University of Southern California)
- Ron Shamir (Tel-Aviv University, Israel)
- Michael Waterman, General RECOMB Chair (University of Southern California)

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- Sorin Istrail, Conference Chair (Sandia National Laboratories)
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