

## **CURRICULUM VITAE (abridged)**

**NAME:** Howard S. Taylor

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**DATE OF BIRTH:** September 17, 1935, New York City

**MARITAL STATUS:** Married, three daughters

### **ACADEMIC BACKGROUND:**

B.A.: 1956, Columbia University, New York  
Summa Cum Laude with Distinction in Chemistry

Ph.D.: Theoretical Chemistry, 1959, University of California, Berkeley  
Research Director: F.E. Harris  
Thesis Subject: The Quantum Theory of Small Diatomic Molecules  
University Fellow in Chemistry

Postdoctoral: Universite Libre de Bruxelles, 1959-61  
Research Director: Professor I. Prigogine  
N.S.F. Postdoctoral Fellow

Graduate: N.S.F. Predoctoral Fellow  
University of California Fellowship

Undergraduate: Boese Scholarship  
Phi Beta Kappa  
Phi Lambda Upsilon  
Undergraduate Chemistry Society  
Crew

## **ACADEMIC POSITIONS :**

1961-64	Assistant Professor of Chemistry, University of Southern California
1962	Visiting Professor of Chemistry, New York University, October 1962
1964-67	Associate Professor of Chemistry, University of Southern California
1966-67	Guest Professor of Physics, Freiberg University, Freiberg, West Germany
1967-Present	Professor of Chemistry, University of Southern California
1973-Present	Professor of Theoretical Physics, University of Southern California
1974-75	Alex Von Humboldt Awardee in Theoretical Chemistry, Technische Universitat Munchen
1977	Visiting Professor, Univ. of Paris Sud, France
1979	Visiting Scientist, Japanese Society for Promotion of Science
1980	Visiting Professor, Bielefeld University, Germany
1982-83	Guest Scientist, FOM Institute for Atomic and Molecular Physics, Amsterdam, The Netherlands
1982-83	Visiting Research Scholar and Lecturer, Kaiserslautern University, W. Germany
1986	Visiting Professor, University of Uppsala.
2005	Research Professor Emeritus, Department of Chemistry, University of Southern California.

## **COMMITTEE:**

National Academy of Science Committee on Atomic and Molecular Physics 1979-1980

Board of Directors, ICPEAC for 1979-80

Board of Directors, NATO Fusion Conference, France, August 1979.

Advisory Editorial Board, International Journal of Quantum Chemistry 1979-1984.

XIII ICPEAC Symposium, Advisory Committee, Berlin, August 1983.

American Chemical Society, Executive Committee, Division of Phys. Chem., 1982-84

Managing Committee for the Teluride Summer school on Molecular Vibrations.

## **AWARDS AND HONORS:**

Elected to Membership, American Association of Arts and Sciences, 2008

Max Planck Research Award for Atomic and Molecular Physics, 1992. Awarded by the German Ministry of Science through the Max Planck Society and Alexander von Humboldt Foundation.

Fellow of the American Physical Society, 1972

USC Associates Award for Creative Scholarship and Research: 1974

Senior Humboldt Awardees: 1974-75, Technical University of Munich

Alfred P. Sloan Foundation Fellow: 1965-71

Japanese Society for Promotion of Science, Japan, 2 months as guest, September-October 19793

Guest Professor for 1 year in Amsterdam, Munich and Freiberg.

Invited to apply for a "Nordica" Professorship in Uppsala, Sweden, in Theoretical Chemistry, 1981. (Declined)

Invited to spend sabbatical at University of Rome and Frascati, Italy, as Visiting Professor (1982). (Declined)

Invited to spend sabbatical at FOM-Institute in Amsterdam, Netherlands as Visiting Professor (1982). (Accepted).

Fulbright Awardee 1966 (Declined).

NSF Postdoctoral Fellowship 1959-61

NSF Graduate Fellowship 1956-59

## **ACADEMIC:**

Chemistry 040X Preparation for Chemistry

Chemistry 105aL Inorganic Chemistry & Qualitative Analysis

Chemistry 538a Mathematical Techniques of Chemical Physics

Chemistry 385 Colloquium (for non-majors)

Chemistry 544 Quantum Chemistry

Chemistry 684a Group Theory

## **CONSULTANTSHIPS:**

Jet Propulsion Laboratory  
Los Alamos National Laboratory  
Lawrence Livermore National Laboratory

## **RESEARCH GRANTS**

NSF "Periodic Orbit Quantization by Signal Processing Methods", 7/15/00 to 6/30/05  
NSF "SGER Grant: Improving Sensitivity in NMR Experiments" 7/15/03 to 6/30/04  
NSF: Physics "Periodic Orbit Quantization by Harmonic Inversion" 8/1/98 to 10/31/04  
DOE: "A Scaling Theory for the Assignment of Spectra in the Irregular Region" 07/01/94 to 06/30/00  
ACS-PRF, Improving on the Fourier Transform: A New Signal Estimator for Use in Theory and Experiment", 06/30/00 to 12/30/04.  
NSF "Filter Diagonalization Signal Processing Applied to ICR Signals", 3/2/98 to 9/1/98  
NSF Grant: 12/91-12/94, "Extraction of Dynamics from Chaotic Spectra",  
DOE, "The Extraction of Underlying Molecular Vibrational Dynamics from Complex Spectral Regions", 7/1/94 to 12/31/04  
NSF National Center for Computational Electronics, 01/01/94-12/31/94  
Alexander von Humboldt Foundation and Max Planck Societies, Atomic And Molecular Physics, Research Award for cooperative research with German Coworkers. 1992-1997  
Israeli Binational Grant with Eli Pollak, Weizmann Institute, Rehovot, Israel, 91-92.  
NATO Research Award for collaboration at the, Institute of Electronic Structure & Laser Foundation of Research and Technology, Hellas Research Center of Crete, Iraklion 711 10, Crete, Greece, 91-92.  
NSF Division of International Programs: 09/91- 08/92  
NSF CHE-8820886: "Studies of the Dynamics Involved in Chaotic Spectra and Excitation Processes" 1989-1991.  
PRF-ACS Grant - "The Interpretation of Chaotic Spectra", \$40,000, 12/01/88-11/30/90.  
USC FRIF Grant - 1988-1989.

NATO Grant: Co-PI, Roland Lefebvre, Laboratoire de Photophysique Moléculaire, Université de Paris-Sud, 1987-1989.

National Science Foundation, Division of International Relations in Yugoslavia for Research on Charge Transfer. 1990

National Science Foundation Grant - 09/01/85-08/31/89.

DOE "Fusion Charge Transfer", 1981-1982.

NSF Grant, "Atomic and Molecular Physics", 1981-1982.

Office of Naval Research and Advanced Projects Adm., "Potential Curves for Excimer System", 1976-1980.

NSF Grant, Research in Atomic and Molecular Physics, 1976-1980.

The Petroleum Research Fund, "Semi-Empirical Elastic Electron-Atom (molecule) Scattering Theory", 1974-1976.

California Institute of Technology President's Fund, 1969-1971, Elastic and Reactive Scattering of Low-Energy Electrons by Polyatomic Molecules.

NSF grant, "Scattering Electrons from Atoms and Molecules", 1968-1971.

Alfred P. Sloan Foundation Fellow, 1965-1971.

NASA Contract on Second Order Perturbation Theory in Atoms and Molecules, 1964-1965.

Office of Naval Research Contract on Irreversible Statistical Mechanics, 1963-1965.

Joint Services Contract Participant on Second Order Perturbation Theory in Atoms and Molecules, 1963-1964.

### **III. RESEARCH ASSOCIATES AND ASSISTANTS:**

#### **Graduate Students:**

E. Atilgan, Department of Mechanical Engineering, Johns Hopkins University, Baltimore, Maryland  
Y.Y. Bai, Professor Department of Chemistry, Houston Central College, Texas  
G.Y. Csanak, Research Scientist, Los Alamos National Laboratory, New Mexico  
P. Driessden, Electrobels Ltd., Brussels, Belgium  
G.O. Hahn, Icitiro Corp, Seoul, Korea  
J. Krebs (Deceased)  
T.R. Rasuri, Pune, India  
S. Saini, Senior Computer Scientist, NASA AMBS Research Center, Moffet Field, CA  
S.W. Wang, Staff Scientist, Linear Accelerator Facility, Stanford University, California  
R.L. Wilkens (Retired), Research Scientist, Aerospace Corporation, Los Angeles, California  
J.K. Williams, U.S. Navy (Retired) Professor at Annapolis, U.S. Navy Academy  
B.S. Yarlagaadda, Staff Scientist, Argonne National laboratory, Argonne, Illinois

#### **Associates:**

K.L. Balaja, Professor of Physics, University of New Dehli, New Dehli, India  
D. Belkic, Professor Department of Radiation Physics, Karolinska Institute, Stockholm, Sweden  
F. Bobrowicz, Staff Scientist, Los Alamos National laboratory, New Mexico  
C.R. Claydon, Staff Scientist, Battelle Institute Technology Center, Columbus, Ohio  
S. Cavalli, Department of Chemistry, University of Perugia, Perugia, Italy  
K. Deguchi, Department of Chemistry, Faculty of Science, Kanazawa University, Japan  
I. Elizar (Deceased)  
S.C. Farantos, Professor Department of Chemistry, University of Crete Iraklion, Crete, Greece  
E. Ficocelli (Deceased)  
R. Gayet, Professor of Physics, University of Bordeaux, Bordeaux, France  
A. Golebiewski (Deceased) Professor of Theoretical Chemistry, Vice Rector Jagiellonian University, Krakow, Poland  
J.M. Gomez-Llrente, Professor of Chemical Physics, University of Laguna, Tenerife, Spain  
T.P. Grosdanov, Professor Institute of Physics, Belgrade, Serbia  
A.U. Hazi (Retired), Physics Division, Lawrence Livermore Laboratory, California  
G. Hose, Department of chemistry, University of Chicago, Illinois  
C. Jung, Professor of Physics, Autonomous University of Mexico, Physics Institute Cuernavaca, Mexico  
M. Kaluza, Department of Physics, University of Maribor, Maribor, Slovenia  
S.D. Kunikeev, Senior Researcher, Department of Nuclear Physics, Skobeltsyn Institute, Moscow State University, Moscow, Russia  
J. Main, Theoretical Physics I, University of Stuttgart, Stuttgart, Germany  
V. Mandelshtam, Professor Department of Chemistry, UC Irvine, California  
G.V. Nazeroff, Professor of Chemistry, Indiana University, South Bend, Indiana

T. Noro, Chemistry, Hokkaido Information University, Japan  
 C. Rankin  
 B. Schneider, Physics, National Science Foundation, Washington DC  
 T. Scott, Physics Department, University of Durham, UK  
 J. Stecki, Professor of Chemistry, Institute Physical Chemistry, Polish Academy of Science, Warsaw, Poland  
 K. Stephanski, Professor Institute of Physics, Nicholas Copernicus University, Torin, Poland  
 D. Tripathy, Professor, Visva-Bharati University, Visva-Santiniketan, W. Bengal, India  
 M. Valley, Staff Scientist, TRW Research, Los Angeles, California  
 H. Waalkins, School of Mathematics, University of Bristol, Bristol, UK  
 R. Yaris, Professor of Chemistry, Washington University, St. Louis, Missouri  
 A. Yates, President and Professor of Chemistry, Colorado State University, Colorado  
 J. Zabrbewski, Professor, Institute of Physics, Jagiellouian University, Krakoro, Poland

## V. INVITED LECTURES AND PRESENTATIONS FROM 1991 TO PRESENT

### 1991

February 18	Ohio State University, Department of Chemistry, Chemical Physics Seminar
February 21	Argonne National Laboratory, Chemistry Division, Argonne, IL; Seminar
April 2	University of Chicago, Department of Chemistry, Guest Speaker at Celebration of 60th Birthday of Professor R.S. Berry, Lecture
April 19	U. C. Irvine, Department of Chemistry and Biochemistry, Chemical Physics Seminar
June 3	Oak Ridge National Laboratory, Oak Ridge, TN, Chemical Physics Seminar
June 4	University of Tennessee, Department of Physics, Chemical Physics Seminar
June 6	Princeton University Department of Chemistry, Princeton, NJ, Chemical Physics Seminar
July 15	Gordon Conference on Atomic Molecules and Physics, Session Chairman and Invited "Reviews" Speaker, Wolfboro, New Hampshire
July	Weizmann Institute, Department of Chemistry, Rehovot, Israel, July 1991. Lecture
July	University of Crete, Department of Chemistry and Institute of Electronic Structure and Laser, Research Center of Crete (FORTH), Iraklion, Crete, Greece Lecture
September	University of California, Irvine, Department of Chemistry. Seminar

### 1992

January	University of California, Berkeley, U.S.-Israel Bi-National Conference, Chemical Physics Seminar, Berkely, CA.
February	University of Wisconsin, Department of Chemistry, Chemical Physics Seminar
February 6	University of Wisconsin, Department of Physics Seminar.

April	NATO Advanced Research Workshop, Snowbird, Utah. Talk
May 19-20	American Physical Society, DAMOP Meeting, Chicago, IL
May	Freiburg University, Physics Department, Freiberg, Germany. Lecture
June	University of Heidelberg, Department of Theoretical Chemistry. Lecture
July	Swiss Federal Institute, Chemistry Department Seminar, Zurich, Switzerland. Lecture

### 1993

January	NASA Ames Laboratory, Chemistry & Dynamics Division, Theoretical Chemistry. Seminar
January 7	Lawrence Livermore National Laboratory, Department of Energy, Physics Division, Seminar
June	Second International Symposium on Modern Chemistry, Zhengzhou, P.R. China, (declined).
June – July	Workshop on Computer Simulations in Nonlinear Optics (CSNO-93), Saratov-Moscow, Russia, (declined).
October	Institute for Theoretical Atomic and Molecular Physics, Harvard-Smithsonian Center for Astrophysics. Seminar
November 2-4	Dr. Wilhelm Heinrich Heraeus und Else Heraeus-Stiftung, Physikzentrum Bad Honnef (Germany), Applied Periodic Orbit Theory Conference. Talk
November 5	University of Bielefeld, (Germany), Physics Institute. Seminar
December 14	University of Southern California, Department of Physics and Astronomy, Atomic Physics Seminar.

### 1994

January 17	University of Illinois, Department of Chemistry, Chemical Physics Seminar. University of Illinois, Beckmann Institute: Center for Computational Electronics. Seminar
February	University of Texas, Department of Chemistry, Chemical Physics Seminar.
February	Joint Institute of Laboratory Astrophysics (JILA) and Department of Physics, Seminar
March	University of Berlin (Theoretical Chemistry). Seminar
March	Bochum University (Theoretical Physics). Seminar
March	Dresden/Rosendorf Nuclear Lab (East Germany's "Los Alamos"). Seminar
March	University of Kaiserslautern, (Theoretical Physics). Seminar
March	Technical Institute, Darmstadt. Seminar
March	University of Freiburg (Theoretical Physics). Seminar
April 18-22	American Physical Society Meeting, Washington, D.C.: Joint DCP and DEAOP Symposium on Reactive Scattering, Washington, D.C.
April 25	Harvard-Smithsonian Center for Astrophysics, Reactive Scattering Workshop; Talk
May 2	Emory University, Chemistry Seminar
May 3	Georgia State University, Physics Seminar
May 4	Georgia Institute of Technology, Physics Seminar

- May 18-20 National Council for Computational Electronics (NCCE), Workshop, Portland, Oregon
- July Workshop on Reactive Scattering, Harvard Smithsonian - Institute for Theoretical, Atomic and Molecular Physics. Talk

### 1995

- May 12 Autonomous National University of Mexico (UNAM), Department of Chemistry, Mexico City, Mexico. Seminar
- May 15 Autonomous National University of Mexico (UNAM), Institute of Physics, Cuernavaca, Morelos, Mexico. Seminar
- June 2-3 University of Chicago, Department of Chemistry, Mini-Symposium/Celebration in Honor of John Light's 60th Birthday; Talk.
- June 12-16 Institute for Mathematics and its Applications, Workshop on "Multiparticle Quantum Scattering with Applications to Nuclear, Atomic, and Molecular Physics, University of Minnesota, Minneapolis, Lecture given by co-worker; I was ill.
- August 30 University of Nottingham, Department of Chemistry, CCP6 Conference on Reactive Scattering, Nottingham, U.K., Lecture
- September 10-13 University of Freiburg, Department of Physics, Memorial Symposium on Chaos for Professor Dieter Wintegen, Chaotic Phenomena; Talk

### 1996

- April University of Georgia, Chemistry. Seminar
- April Georgia Institute of Technology, Chemistry. Seminar
- April 30 University of California at San Diego, Department of Chemistry. Seminar
- May APS Many Body Section Symposium on Reactive Scattering, Indianapolis.
- June Physics Department, University of Essen, Germany. Seminar
- June Chemistry Department, Stuttgart, Germany
- June Technical University of Munich, Chemical Department, Germany. Seminar
- June Department of Chemistry, University of Freiberg, Germany. Seminar
- July 20-25 The University of Utah, Department of Chemistry, 1996 American Conference on Theoretical Chemistry (ACTC 96). Lecture
- July-August Telluride Conference, "Intramolecular Dynamics & Spectroscopy", Division of Physical Chemistry, Lecture
- October 28 Department of Chemistry, Rice University. Seminar
- October 14-16 Special Research Project, French and German Universities Meeting, Colmar, France. Talk

### 1997

- February 9-12 Workshop on "Comparisons of Classical and Quantum Dynamics", Las Cruces, New Mexico. Talk
- May University of Wisconsin, Chemical Physics Seminar.
- July-August Telluride workshop, on Quantum Reactive Scattering; Lecture

June Dresden, Meeting on Complex Systems, Max Planck Institute. Talk  
 June Physics Seminar, Freiburg University.  
 June Physics Seminar, Bochum University  
 Fall UCLA Department of Chemistry, Physical Chemistry Seminar.

### 1998

Jan 23 University College London, Joint Seminar of the Theoretical Chemistry and Atomic Physics Sections, Seminar.  
 February 21 University of Utah Symposium for F. Harris, Talk.  
 February Physical Chemistry Seminar, University of College London  
 February 23-25 Lake Tahoe Conference on ICR Studies of Complexes, (declined)  
 March (1) UNAM- Institute of Theoretical Physics in Cuernavaca, Mexico. Seminar  
 (2) Physics Department UNAM - Mexico City, Seminar  
 April 20 Institute of Theoretical Atomic and Molecular Physics at Harvard. Meeting on "Quantum Integrability in Molecular Systems" Talk  
 June 27 University College London meeting, on Highly Excited Molecular Rovibrational States, Talk.  
 June St. Andrews University, Scotland. Faraday Society meeting on "Reactive Scattering"  
 August 1 Telluride Workshop on Large Amplitude Vibrations, Talk  
 August 23-28 ACS Symposium, Boston, Topics in High Resolution Spectroscopy

### 1999

February Workshop on "Resonances The Technicon", Hiafa, Israel. Two lectures  
 (1) "Stabilization Methods" (2) "Signal Processing."  
 May DOE Contractors Meeting of the Combustion Program. Report.

### 2000

February  
 1) Institute for Science-UNAM Cuernavaca Mexico, "Complex Systems Non-Linear and Molecular Spectra", workshop. Talk  
 2) Physics Institute University of Puebla, "Signal Processing in Atomic and Molecular Physics". Seminar  
 3) Physics Institute UNAM Cuernavaca, "Signal Process in Chemistry and Physics". Seminar  
 February 13-19 La Havana, Cuba "Photodynamics from Isolated Molecules to Condensed Phases", workshop. Did not go for Dept of State (denied visit by USA). Talk  
 March Georgia Technology, Chemistry, Theoretical Chemistry Institute. Seminar  
 March University of Florida, two lectures.  
 March Emory University, Chemistry, lecture  
 April-May University College London, two lectures (1) Physics, (2) Chemistry.  
 April Visiting Distinguished Professor University of Bremen. two lectures.  
 April Physics Department Seminar, University Stuttgart, Germany. Seminar

April	Chemistry Technical University of Munich, Germany. Seminar
April	University of Munich, Chemistry, Germany. Seminar
May	Heidelberg "Theoretical Chemistry"
June	ETH Zurich (Chemistry) (two lectures).
June	Oxford Theoretical Chemistry two lectures.
June	University of Louvain, Belgium-Physics, seminar.
July	CECAM workshop on "High Excited States" Lyon France. Talk
July	University of Paris Sud Invited lecturer (declined).
July 28	California Institute of Technology Workshop on Nonlinear Dynamics and Multimode Molecules, Invited lecturer (declined).

## 2001

January 12-14	Workshop on Quantum Reaction Dynamics, (declined)
March 29-31	W. Miller's 60th Birthday Symposium: Chemical Dynamics Symposium at Berkeley. Talk
May	DOE Contractors Meeting of the Combustion Program. Report
August	ACS National Symposium, Chicago
July 8 – 13	Stat Phy-21, "Locally Integral Structures and Interpretation Complex Molecular Spectra", Cacoyoc, Mexico.
September	Workshop on Quantum Classical Breathers, Max Planck Institute on Complex System; Desden Germany (Declined).

## 2002

January	On Signal Processing at the Center of Complex Systems, Science Center, Cuernavaca, Mexico. 2 Lectures
February	Meeting "Molecular Photodynamics" in Havana, Cuba. Talk
March	"Molecular Spectroscopy" a two week school and meeting on "Application of Chaos Theory" at the <u>National British Center for Mathematics at the Warwick University, England</u> . Talk
April	Invited Lecturer <u>Orlando ACS Meeting</u> . The lecture was on my "Spectroscopy" work and was part of a Symposium on chemical reactivity and photo dissociation
April	Guest of the Georgia Technology Center for Complex System (in the Physics Department) and spoke on Chaos and Spectroscopy; 1 Lecture
May	Physical Chemistry Seminar, University of North Carolina (Chapel Hill) on Spectroscopy.
May	"Chaos and Spectroscopy" Annual Meeting of American Mathematical Society on Mathematics and Dynamics, University of North Carolina, Wilmington, North Carolina. Talk
June	Invited Speaker Conference on Theoretical Chemistry, Jagallonean University, Krakow, Poland
June	Max Planck Institute for Complex Systems in Dresden, Germany, visiting scientist. Lecturer on theory of Semiclassical methods that use periodic orbits to compute quantum responses and spectral quantities.

## 2003

March 4,	Physical Chemistry Seminar at UC Irvine..
March 26	Physics Seminar at UNAM, in Cuernavaeca, Mexico.
April 23	Seminar Organic Chemistry Loker Hydrocarbon Institute, USC
April 29	Joint Chemical Physics and Organic Seminar, Cal Tech.
May	DOE Contractors Meeting of the Combustion Program. Report
June 14-23	Reactive Scattering Workshop Molecular, Estoril, Spain, Invited Lecturer
August 3-10	Telluride Meeting on "Vibrational Dynamics". Invited lecturer
August 4-9	"Dynamical Chaos in Classical and Quantum Physics" Novosibirsk, Russia. Invited Lecturer (Declined)

## 2004 INVITED LECTURES AND MEETINGS

March	ACS Meeting: Symposium on "Quantum, Classical and Semiclassical Dynamics.
April 4-8	Keynote Speaker: Modern Trends in Physics Research, Cairo, Egypt.
May	DOE Contractors Meeting of the Combustion Program. Report
June 16-19	Invited lecturer to 5th AIMS International Conference on Dynamical Systems and differential Equations, Cal State Poly University (Declined)
July	International Conference on Phosphorous Chemistry. Birmingham, UK
October	UC Davis Chemistry Department Symposium

## 2005 INVITED LECTURES AND MEETING

April 10	Experimental NMR Conference, Providence, RI (Poster)
May 16	ACS Meeting-DCP Symposium on NMR, San Diego, CA
May	DOE Contractors Meeting of the Combustion Program. Report
July	VIII workshop on Quantum Reactive Scattering. Invited lecture
August	Telluride Meeting on "Vibrational Dynamics". Invited lecturer

## 2006

June 3	Symposium in honor of B. Schneider, Santa Fe, NM
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## 2007

March	Institute of Chemical Physics, Chinese Academy of Sciences. Dalian China. Two lectures on "Vibrations" and NMR Signal Processing Institute of Organic Chemistry, Chinese Academy of Sciences. Shanghai, China. On NMR Signal Processing.
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