

**Michael F. Singer**  
**B.A., M.A., Ph.D.**  
**Professor of Mathematics**  
**North Carolina State University**

## CURRICULUM VITAE

### Address

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### Education

1970 B.A., Mathematics, New York University  
1972 M.A., Mathematics, University of California at Berkeley,  
1974 Ph.D., Mathematics, University of California at Berkeley, Thesis:  
Functions Satisfying Elementary Relations, Advisor: Maxwell Rosenlicht

### Academic and Related Professional Experience

July 2016 -	Professor Emeritus, North Carolina State University
2018-1019	Assistant Director, MSRI
October 2017	Member, Erwin Schrödinger International Institute for Mathematics and Physics, Vienna
October, 2015	Member, Fields Institute, Toronto
January, 2015	Distinguished PIMS Visiting Scholar at Simon Fraser University, Vancouver
April, May 2014	Member, MSRI Berkeley, California
September 2012-	Fellow, American Mathematical Society
May 2012	Visiting Professor of Mathematics, University Louis Pasteur, Strasbourg
October, 2011	Visiting Professor of Mathematics, University Louis Pasteur, Strasbourg
May, 2009	Member, Isaac Newton Institute, Cambridge, UK
May, 2008	Visiting Professor of Mathematics, University Louis Pasteur, Strasbourg
June, 2006	Member, Max Planck Institute, Bonn
June, 2005	Member, Isaac Newton Institute, Cambridge, UK
October, 2003	Visiting Professor of Mathematics, University Louis Pasteur, Strasbourg
2002 - 2003	Acting Director, MSRI
2001 - 2002	Deputy Director, MSRI
May, 2000	Visiting Professor of Mathematics, University of Rennes I
Fall, 2000	Acting Deputy Director, MSRI, Berkeley, California

Fall, 1998	Chair, Organizing Committee and Member of Special Semester:Symbolic Computation in Geometry and Analysis, MSRI, Berkeley, California
May, June 1998	Visiting Professor of Mathematics, University Louis Pasteur, Strasbourg
May 1995	Visiting Professor of Mathematics, University of Rennes I
June, July 1994	Visiting Professor of Mathematics, University Louis Pasteur, Strasbourg
May 1994	Visiting Professor of Mathematics, University of Lille
December 1990	Visiting Professor of Computer Science, University of Bonn
October 1989	Visiting Professor of Computer Science, University of Bonn
May 1989	Visiting Professor of Mathematics, University Louis Pasteur, Strasbourg
Spring 1989	Visiting Professor of Mathematics, Johannes Kepler University-Linz
1986-2016	Professor of Mathematics, North Carolina State University
1982-1986	Associate Professor of Mathematics, North Carolina State University
Spring 1985	Member, Institute for Advanced Study
1977-1982	Assistant Professor of Mathematics, North Carolina State University
1979-1980	Visiting Assistant Professor of Mathematics, Princeton University
1978-1979	Member, Institute for Advanced Study
1976-1977	Visiting Assistant Professor of Mathematics, North Carolina State University
1974-1976	Instructor of Mathematics, SUNY at Stony Brook

### Professional Activities and Society Memberships

2017-2020	Member, AMS Committee on Publications
2016-2019	Member, AMS-Simons Travel Grant Selection Committee; Chair 2017-2018
2015-present	Member, Advisory Board, Journal of Integrable Systems
2014-2020	Member, Board of Directors, Foundations of Computational Mathematics Soc. Secretary 2017 - 2020
1985-2022	Member of the editorial board, Journal of Symbolic Computation.
1996-present	Associate editor, Applicable Algebra in Engin., Commun., and Comput.
2004-2023	Member of the editorial board, Algorithms and Computation in Mathematics (Springer Book Series)
2006-present	Member of the editorial board, Algebra and Number Theory
Feb. 2009-Jan. 2012	Member, Editorial Board Committee, American Mathematical Society
Jan. 2005 -Jan. 2008	Member of the Council of the AMS; Member, Committee on Science Policy; Member, Committee on Committees.
Sept. 2004 -June 2005	Member, Scientific Advisory Board, Banff International Research Station
May 2018	Co-organizer, Algebra, Arithmetic and Combinatorics of Differential and Difference Equations, CIRM, Luminy, France
Oct. 2017	Co-organizer, Algorithmic and Enumerative Combinatorics, Erwin Schrödinger International Institute for Mathematics and Physics, Vienna
Sept. 2017	Co-organizer, Lattice Walks at the Interface of Algebra, Analysis and Combinatorics BIRS, Banff, Canada
Oct. 2016	Member, Program Committee, Differential Algebra and Related Topics (DART VII), New York City

July 2016 Co-organizer, Difference Galois Theory Workshop, Symmetries and Integrability of Difference Equations (SIDE16), Montreal  
 Aug 2015 Co-organizer, SIAM Applied Algebraic Geometry Minisymposium on Symbolic Combinatorics, Beijing  
 Aug 2015 Member, Program Committee, Differential Algebra and Related Topics (DART VI), Beijing  
 July 2014 Member, Program Committee, International Symposium on Symbolic and Algebraic Computation (ISSAC 2014), Kobe  
 April 2014 Co-Organizer, AMS Special Session on Differential Algebra and Galois Theory, Lubbock  
 Sept. 2013 Co-organizer, Triangle Lectures in Combinatorics, NCSU, Raleigh, NC  
 Aug 2013 Co-organizer, SIAM Applied Algebraic Geometry Minisymposium on Symbolic Combinatorics, Ft. Collins, CO.  
 Jan 2012 Co-organizer, AMS Special Session, Differential Algebraic Geometry and Galois Theory, Boston  
 Oct 2011 Member, Organizing Committee, SIAM Conference on Applied Algebraic Geometry and co-organizer of Symbolic Combinatorics Session, Raleigh, NC  
 July 2011 Member, Organizing Committee, Workshop on Symbolic Analysis, Foundations of Computational Mathematics (FoCM), Budapest  
 May 2011 Member, Organizing Committee, Methods effectifs en geometrie algébriques (MEGA11), Stockholm  
 Oct. 2010 Member, Organizing Committee, Differential Algebra and Related Topics (DART IV), Beijing China  
 April, 2009 Co-organizer, AMS Special Session on Recent Advances in Symbolic Algebra and Analysis, Raleigh, NC  
 October, 2008 Member, Organizing Committee, Differential Algebra and Related Topics (DART III), Rutgers, Newark  
 June 2008 Member, Organizing Committee, Workshop on Symbolic Analysis, Foundations of Computational Mathematics, Hong Kong  
 July 2005 Member, Organizing Committee, Workshop on Symbolic Analysis, Foundations of Computational Mathematics, Santander  
 July 2004 Program Committee Chair, International Symposium on Symbolic and Algebraic Computation (ISSAC 2004), Santander  
 March 2004 Member, Organizing Committee, Differential and Arithmetic Galois Theory, Luminy  
 July 2002 Member, Program Committee, International Symposium on Symbolic and Algebraic Computation (ISSAC 2002). Lille  
 June 2000 Co-organizer and Editor of Proceedings, Effective Methods in Algebraic geometry (MEGA), Bath  
 April 1999 Co-organizer, East Coast Computer Algebra Day, Raleigh.  
 Fall 1998 Chair, Organizing Committee, special semester "Symbolic Computation in Geometry and Analysis", MSRI, Berkeley.  
 Fall, 1998 Co-organizer of the workshop "Groupes de Galois différentiels" CIRM, Luminy.  
 April 1996 Co-organizer of the Special Session "Differential Algebra" AMS Meeting, New York.  
 March 1996 Co-organizer of the "Mid-Atlantic Algebra Conference" North Carolina State University, Raleigh.

June 1992 Co-Organizer of the workshop on “Computer Algebra and Differential Equations” (CADE III) Marseilles.

December 1991 Co-organizer of the workshop “Efficient Interpolation Algorithms” Dagstuhl, Germany. ,

May 1990 Co-organizer of the workshop “Computer Algebra and Differential Equations” (CADE II) Cornell University.

July 1990 Program committee member, ISSAC '90.

May 1989 Co-organizer of the workshop “Symbolic Computation in Differential Equations” IMA, University of Minnesota.

December 1988 Co-organizer of the NSF sponsored conference “Kac-Moody Lie Algebras and Physics” North Carolina State University.

May 1988 Co-organizer of the workshop “Computer Algebra and Differential Equations” (CADE I) University of Grenoble.

Member, Association for Computing Machinery, AMS, MAA, SIAM

## Grants

- NSF Graduate Fellowship: 1970-1973
- State University of New York Research Foundation Fellowship: Summer 1975
- N.C. State University Engineering Foundation Fellowship: Summer 1977
- NSF Research Fellowship: June 1975-November 1976 (with J. Ax); June 1979-November 1981 (with S. Schechter); June 1985-November 1987; June 1988-November 1990; April 1991-September 1993; June 1995 - May 1998; June 1998 - May 2001; June 2001 - August 2006; September 2006 - August 2010; August 2010 - July 2014
- N.C. State University Instructional Computing Grant (with Rose) 1984
- NSF SCREMS (with Shearer, Helminck, Wright) June 1988-June 1989
- NSF Computer Algebra and Differential Equations Conference: March 1988-March 1989
- NSF Kac-Moody Lie Algebras and Physics Conference: March 1988-March 1989
- DAAD Study Visit Research Grant for research in Germany, 1991
- NSF Scientific Computation: Graduate Level Courses, Computers and Fellowships Grant (with Kelley and Shearer): May 1992-May 1993
- NSA Differential Galois Theory Conference (Luminy): January 1999 - September 1999
- NSF East Coast Computer Algebra Day (with Hong, Kaltofen): March 99 - September 1999
- NSF SCREMS (with Hong, Kaltofen, Helminck) June 1999-June 2002
- NSA Arithmetic and Differential Galois Theory Conference (Luminy) January 2004-September 2004
- NSF Workshops for NCSU/China Research and Education Partnership in Symbolic Computation (with Hong, Kaltofen, Szanto): July 2005 - June 2008
- NSF SCREMS (with Helminck, Hong, Kaltofen, Kogan, Szanto) August 2005-July 2008

- NSF EMSW21-MCTP: Institute for Mathematics at North Carolina State University (with Banks, Campbell, Helminck, Medhin) September 2006 - August 2009; May 2010 - April 2013
- NSA Geometric and Differential Galois Theory Workshop (Luminy) January 2010 - December 2010
- NSF EMSW21-MCTP: Institute for Mathematics at North Carolina State University (with Banks, Campbell, Helminck, Medhin) August 2010 - July 2013
- NSF Conference on the Foundations of Computational Mathematics (with Agnes Szanto) April 1, 2011 - March 31, 2012
- Simons Foundation Collaboration Grant for Mathematicians, September 2015 - August 2020

### Postdocs Supervision

Felix Ulmer, 1991-1993 at NCSU; Professor of Mathematics, University of Rennes  
 Evelyne Hubert, 1998-1999 at MSRI; Directrix de Recherche, INRIA, Sophia Antipolis  
 Lourdes Juan, 2000-2001 at MSRI; Associate Professor, Texas Tech University  
 Ruyong Feng, 2007-2008 at NCSU; Professor, Key Laboratory of  
 Mathematics Mechanization, Institute of Systems Sciences, Academica Sinica, Beijing.  
 Shaoshi Chen, 2011-2013 at NCSU; Associate Professor, Key Laboratory of  
 Mathematics Mechanization, Institute of Systems Sciences, Academica Sinica, Beijing.  
 Carlos Arreche, 2014-2017 at NCSU; Assistant Professor, University of Texas, Dallas

### Graduate Students

Knowles, Paul, Ph.D. (NCSU), 1986, Associate Professor of Mathematics,  
 D'Youville College.  
 Ulmer, Felix, Ph.D. (U. of Karlsruhe; Co-director with J. Calmet), 1991,  
 Professor of Mathematics, University of Rennes I.  
 Hessinger, Sabrina, Ph.D. (NCSU), 1997, Associate Professor of Mathematics, Atlantic  
 Armstrong University  
 Berman, Peter, Ph.D. (NCSU), 2002, ActiFi, Inc., Plymouth, MN  
 Person (Faughn), Axelle, Ph. D., (NCSU; Co-dir. F. Ulmer), 2003, Associate Professor,  
 Western Carolina U  
 Philippe Gaillard, Ph.D., (U. of Rennes; co-directing with F. Ulmer) 2004,  
 Alexey Ovchinnikov, Ph.D., (NCSU), 2007, Associate Professor, Queens College,  
 City University of New York. Recipient of an NSF CAREER Grant 2010.  
 Clemens Raab, Ph.D., (Johannes Kepler U., Linz; co-directed with P. Paule), 2012,  
 Research Scientist, RICAM, Linz.

David Chinkes, M.S., (NCSU) 1990  
 Fred Woodward, M.S., (NCSU) 1993  
 Christina Hewitt, M.S., (NCSU) 2009

In addition, I have been an outside referee for 5 Ph.D. theses in France, 2 in the Netherlands and 2 in Austria as well as an outside referee for 2 Habilitation theses in France. I have been on the Ph.D. committees of 5 NCSU Mathematics students.

## Lectures

I have given approximately 180 invited lectures at professional meetings and at seminars and colloquia at other universities. Since January 1995 I have given the following talks:

- Jan, 1995      Invited one-hour talk, CATHODE Workshop, Nijmegen, The Netherlands
- April, 1995    Principal Speaker, Computer Algebra Day, U. of Delaware
- April, 1995    Third Annual E.R.Kolchin Memorial Lecture, Columbia University
- May, 1995      Invited Seminar talk, U. Paul Sabatier, Toulouse, France
- May, 1995      Invited one-hour talk, Stokes Workshop, Groningen, The Netherlands
- July, 1995     Invited one-hour talk, AMS Summer Institute in Algebraic Geometry, Santa Cruz
- Sept, 1995     Invited one-hour talk, Singularities and Differential Equations Conference,  
Medina del Campo, Spain
  
- April, 1996    Invited seminar talk, Rutgers University
- April, 1996    Invited Colloquium talk, Rutgers University
- April, 1996    Invited one-hour address, AMS regional Meeting, New York City
- June, 1996    Invited one-hour address, MEGA96, Eindhoven, The Netherlands
- June, 1996    Invited seminar talk, Paris VI, France
- Nov, 1996     Invited seminar talk, U. of Groningen
- Jan, 1997      Invited half-hour talk, AMS Special Seesion on Computational Algebraic  
Geometry, San Diego
  
- Jan, 1997      Invited one-hour talk, Geometric Model Theory Workshop, Fields Institute,  
Toronto, Canada
  
- May, 1997      Invited one-hour talk, Computational Aspects of Commutative Algebra  
and Algebraic Geometry, Schloss Dagstuhl, Germany
  
- June, 1997    Invited 40 minute talks, Special Session of an AMS Regional Meeting, Atlanta
- Jan, 1998      Invited two-hour talk, Model Theory Workshop, MSRI, Berkeley
- April, 1998    Two invited one hour seminar talks, University of Strasbourg, France
- June, 1998    Invited 40 minute talk, MEGA98, St. Malo, France
- Nov, 1998     Invited Colloquium talk, UCLA
- Feb, 1999     One-hour talk, Differential Galois Theory Conference, Luminy, France
- May, 1999     Two invited one-hour talks, Differential Galois Theory Workshop, Groningen,  
The Netherlands
  
- July, 1999     Invited one-hour address, ISSAC99, Vancouver
- March, 2000    Invited seminar talk, U. of Angers, France
- May, 2000     Invited seminar talk, U. of Rennes, France
- June, 2000     Invited one-hour talk, AMS Symbolic Computation Conference,  
Mt. Holyoke College
  
- Sept, 2000     Invited algebra seminar talk, UC Berkeley
- Nov, 2000     Invited one-hour talk, Workshop on Differential Algebra, Rutgers University
- March, 2001    Invited Colloquium talk, Arizona State University
- May, 2001     Invited one-hour talk, Differential Galois Theory Conference, Poznan, Poland
- Aug, 2001     Invited one-hour address, International Society for Analysis, Applications  
and Computing Conference, Berlin
  
- Feb, 2002     Two invited one-hour talks, Differential Algebra Seminar, City College Of New York
- Feb, 2002     Invited colloquium talk, MIT Applied Mathematics Colloquium

May, 2002 Invited talk, Infinite Dimensional Lie Algebra Seminar, MSRI  
 Aug, 2002 Invited one hour talk, Foundations of Computational  
 Mathematics Conference, IMA, Minneapolis  
 Oct. 2003 Invited one-hour talk, Analysis Seminar, U. of Strasbourg, France  
 April 2004 Invited Seminar Talk, Academia Sinica, Beijing  
 April 2004 Invited Plenary Talk, Differential Equations and Symbolic Computation  
 Conference, Beijing  
 Nov. 2004 Invited Plenary Talk, Singularities of Differential Equations, Integrable Systems  
 and Quantum Groups, Strasbourg.  
 Feb. 2005 Invited Seminar Talk, Kolchin Seminar on Differential Algebra  
 March 2005 Contributed Talk, AMS Special Session on Classical And Differential Galois  
 Theory, Lubbock Texas,  
 May 2005 Invited Seminar Talk, Newton Institute  
 May 2006 Invited Talk, Symbolic Analysis and Groebner Basis Conference, Linz, Austria  
 Aug, 2006 Invited Lectures of the London Math Society, Heriot-Watt University, Edinburgh  
 (a series of 10 lectures, *An Introduction to the Galois Theory of Differential and  
 Difference Equations*)  
 Sept, 2006 Invited Talk, Differential Equations and Singularities Conference, Tordesillas  
 March, 2007 Invited Talk, Second NCSU-China Symbolic Computation Collaboration Workshop,  
 Hangzhou China  
 April, 2007 Invited Talk, Differential Algebra and Related Topics Conference  
 (DART II), Newark, NJ  
 April 2007 Invited Talk, Advances in Algebra and Geometry  
 MSRI  
 May, 2007 Invited Talk, Arithmetic and Differential Galois Theory  
 Mathematische Forshungsinstitute Oberwolfach  
 June, 2007 Invited Talk, Differential Fields Workshop, University of Leeds  
 Nov. 2007 Invited Talk, Atelier MODNET de Theorie de Modeles des Corps.  
 CIRM, Luminy, France  
 Feb. 2008 Invited Talk, Algebraic Methods in Dynamical Systems, Barcelona, Spain  
 Feb. 2008 Colloquium, University of Montreal  
 March, 2008 Invited Talk, Differential Algebra and Related Computer Algebra  
 Conference, Catania, Italy.  
 May 2008 Invited Talk, Séminaire Equations fonctionnelles, University of Strasbourg.  
 Oct. 2008 Colloquium, Cornell University  
 Oct. 2008 Invited Talk, Lie Groups Seminar, Cornell University  
 Dec. 2008 Invited Talk, Kolchin Seminar in Differential Algebra  
 Feb. 2009 Colloquium, University of Illinois at Chicago  
 April 2009 Colloquium, Indiana University-Purdue University  
 May 2009 Invited Tutorial Lectures, Algebraic Theory of Difference Equations  
 Conference, Leeds  
 July 2009 Invited Talk, Algebraic Analysis and Computer Algebra Conference, Linz  
 July 2009 Invited Speaker, Formal Power Series and Algebraic Combinatorics  
 Conference, Linz  
 July 2009 Invited Seminar talk, RISC, Linz

Jan. 2010 Invited Talk, Special Session on Differential Galois Theory and Group Representations, AMS Meeting, San Francisco  
 March 2010 Invited Talk, Differential And Geometric Galois Theory, CIRM Luminy, France  
 April 2010 Invited Talk, Workshop on Differential Algebraic Geometry, CCNY  
 May 2010 Invited Talk, Algebraic Methods in Dynamical Systems, Bedlewo, Poland  
 June 2011 Invited Talk, Recent Developments in Model Theory, Oleron, France  
 August 2011 Invited Talk, First Latin American School on Algebraic Geometry and Applications Cordoba, Argentina  
 October 2011 Invited Seminar talk, Kolchin Seminar on Differential Algebra, CUNY  
 October 2011 Invited Talk, Équations différentielles et théorie de Galois, IHES, Bures-sur-Yvette  
 October 2011 Invited Talk, Bicentenaire de la naissance d'Evariste Galois, IHP, Paris  
 November 2011 Invited Seminar Talk, Géométrie et Théorie des Modèles Seminaire, University of Paris VI, Paris  
 November 2011 Invited Seminar Talk, Séminaire Équations Fonctionnelles, University of Strasbourg  
 February 2012 Evelyne Nelson Lecture in Logic, McMaster University  
 April 2012 Short course, École franco-chinoise sur les équations différentielles et fonctionnelles, Wuhan China  
 July 2012 Short course, CIMPA Research School, "Galois Theory of Difference Equations" Santa Marta, Columbia  
 September 2012 Invited talk, Differential and difference equations, integrable systems, model theory conference, Leeds, England  
 September 2013 Invited Talk, Dynamical systems and Galoisian theories, Toulouse, France  
 November 2013 Invited Talk, Recent progress in the theory of Painlevé equations, IRMA, Strasbourg, France.  
 April 2014 Invited Talk, Differential and Difference Day, MSRI, Berkeley, California  
 August 2014 Invited Lecture Series, 5 Lectures on Difference Galois Theory, Linz, Austria  
 September 2014 Invited Lecture Series, 6 Lectures on Differential Algebra and Differential Algebraic Groups, Aachen, Germany  
 September 2014 Invited Talk, Clay Research Conference "Functional Transcendence around Ax-Schanuel", Oxford England  
 November 2014 Invited talk, Kolchin Seminar on Differential Algebra, CUNY, New York  
 December 2014 Plenary Lecture, Foundations of Computational Mathematics, Montevideo, Uruguay.  
 February 2015 Invited Seminar Talk, Combinatorics Seminar, Simon Fraser U., Vancouver.  
 August 2015 Kwan Chao-Chih Distinguished Lecture, Academia Sinica, Beijing.  
 October 2015 Colloquium Talk, U. of Waterloo, Waterloo, Canada.  
 April 2016 Invited Talk, Differential Algebra Workshop, Graduate Center, CUNY, New York.  
 October 2016 Invited Talk, Differential Algebra and Related Topics (DART VII), Graduate Center, CUNY, New York  
 November 2016 Colloquium, Dept. of Math., Notre Dame University  
 March 2017 Invited Talk, Special Session on Computability in Algebra and Number Theory Spring Southeastern AMS Sectional Meeting, Charleston, SC  
 March 2017 Plenary Lecture, Functional Equations in Limoges (FELIM 2017)  
 April 2017 Invited Talk, Kolchin Research and Training Workshop, Graduate Center, CUNY, New York



May 2017	Invited Talk, Bridges between Automatic Sequences, Algebra and Number Theory Conference, CRM, Montreal
July 2017	Invited Talk, Foundations of Computational Mathematics, Barcelona, Spain
July 2017	Invited Talk, SIAM Applied Algebraic Geometry, Atlanta, Georgia
Sept. 2017	Invited Talk, Lattice walks at the Interface of Algebra, Analysis and Combinatorics BIRS, Banff, Canada
Oct. 2017	Invited Series of Talks, Workshop on Enumerative Combinatorics, Schrödinger Institute, Vienna, Austria
April 2018	Invited Talk, Symmetry and Computation, CIRM, Luminy, France
October 2018	Invited Talk, Combinatorics Seminar, Berkeley
March 2019	Invited Talk, Combinatorics Seminar, San Francisco State Univ.
May 2019	Invited Talk, Transient Transcendence in Transylvania Conference Brasov, Romania
December 2020	Invited Talk, Geometry and Topology Seminar, Weizmann Institute
February, 2021	Invited Talk, Transcendence et Combinatoire groupe de travail Université de Versailles-St Quentin, Versailles, France
May 2021	Invited Talk, Canadian Discrete and Algorithmic Mathematics Conference (CanaDAM 2021)
June 2021	Invited Talk, Lattice Paths, Combinatorics, and Interactions, CIRM, Luminy, France

### University and Departmental Service

I served on the following committees of the School of Physical and Mathematical Sciences (PAMS): Promotion and Tenure Committee, Research Committee, Scientific Computing Committee.

I served on the following committees in the Department of Mathematics: Faculty Advisory Committee (2 terms), Promotion and Tenure Committee (2 terms), 10 Hiring Committees (4 as chair or co-chair), Qualifying Exam Committee (3 terms), Graduate Program Committee (3 terms), Undergraduate Mathematics Majors Committee (2 terms), Publicity and Awards Committee (Chair, 3 years; Member, 2 years), Graduate Recruiting Committee (5 terms). In addition I served on the committee that wrote the original Promotion and Tenure Guidelines and the Departmental Reorganization Committee that wrote the present Departmental Bylaws.

Besides teaching a wide variety of courses at all levels both to mathematics majors and nonmajors, in sections with as few as 5 students and as large as 240 students, I developed an undergraduate course in Discrete Mathematics (with John Bishir) and a graduate course in Symbolic Computation (that led to the present year-long sequence in this subject) and a semester-long advance undergraduate/beginning graduate course in Computational Algebraic Geometry. I have also taught Special Topics courses in Algebraic Curves, Symbolic Analysis and Differential Galois Theory. I have served for many years as the course coordinator of the Calculus for Life and Business Majors.

### Collaborators

C. Arreche, A. Baider, H. Barcelo, P. Berman, P. Cassidy, B. Caviness, Z. Chatzidakis, S. Chen, R. Churchill, E. Compoint, W. Cook, O. Cormier, J. Davenport, T. Dreyfus, L. van den Dries, R.

Feng, D. Grigor'ev, F. Haimo, C. Hardouin, P. Hendriks, C.W. Henson, E. Hubert, M. Jaroschek, A. Jimenez-Pastor, E. Kaltofen, M. Karpinsky, M. Kauers, Z. Li, P. Ma, A. Minchenko, C. Mitschi, A. Ovchinnikov, V. Pillwein, M. Prella, M. van der Put, D. Rod, J. Roques, M. Rosenlicht, L. Rubel, B.D. Saunders, R. Schäfke, S. Schecter, B. Trager, M. Tretkoff, F. Ulmer, S. Watt, M. Wu, A. Yao, D. Zheng.

## Publications

Many of these papers can be retrieved on the Internet through links from my homepage with URL <http://www.math.ncsu.edu/~singer>.

## Books Edited or Authored by Michael F. Singer

1. *Differential Equations and Computer Algebra*, M.F. Singer, editor, Academic Press, 1991. (This is a collection of papers from the Computer Algebra and Differential Equations Conference held in Ithaca in May 1990).
2. *Galois Theory of Difference Equations* (with M. van der Put), 178 pages, Vol. 1666 of the series *Lecture Notes in Mathematics*, Springer-Verlag 1997 .
3. *Effective Methods in Algebraic Geometry*, M.F. Singer (editor). Selected papers from the conference Méthodes Éffectives en Géométrie Algébriques (MEGA2000), *Journal of Pure and Applied Algebra*, Volume 164, Issues 1-2, October 2001.
4. *Galois Theory of Linear Differential Equations* (with M. van der Put), Vol 328 of *Grundlehren der mathematischen Wissenschaften*, Springer-Verlag, 2003.
5. *Galois Theories of Linear Difference Equations: An Introduction* (C. Hardouin, J. Sauloy, M. F. Singer, editors), *Mathematical Surveys and Monographs*, Volume 211, American Mathematical Society, 2016
6. *Integration in Finite Terms: Fundamental Sources*, (C.G. Raab, M.F. Singer, editors), *Texts & Monographs in Symbolic Computation*, Springer Cham, 2022, <https://link.springer.com/book/10.1007/978-3-030-98767-1>

## Papers

1. Elementary Solutions of Differential Equations, *Pacific Journal of Mathematics*, **59**(2), 1975, 535-547.
2. Solutions of Linear Differential Equations in Function Fields of One Variable, *Proceedings of the American Mathematical Society*, Vol. 54, January 1976, 69-72.
3. Functions Satisfying Elementary Relations, *Transactions of the American Mathematical Society*, **227**, 1977, 185-206.

4. On Elementary, Generalized Elementary, and Liouvillian Extension Fields, **Contributions to Algebra**, Academic Press, 1977 (with M. Rosenlicht).
5. A Class of Differential Fields with Minimal Differential Closures, *Proceedings of the American Mathematical Society*, **69**(2), 1979, 319-322.
6. The Model Theory of Ordered Differential Fields, *The Journal of Symbolic Logic*, **43**(1), 1979, 82-91.
7. Remarks on Analytic Continuation, *Bulletin of the London Mathematical Society*, **12**, 1980, 9-12, (with F. Haimo and M. Tretkoff).
8. Planar Polynomial Foliations, *Proceedings of the American Mathematical Society*, **79**(4), August 1980, 649-656 (with S. Schecter).
9. Singular Points of Planar Vector Fields, *Globay Theory of Dynamic Systems*, Lecture Notes in Mathematics, **819**, Springer-Verlag, 393-410 (with S. Schecter).
10. Separatrices at Singular Points of Planar Vector Fields, *Acta Mathematica*, **45**, 1980, 47-78 ; (with S. Schecter); correction in **151**, 297-298.
11. Algebraic Solutions of  $n^{\text{th}}$  Order Linear Differential Equations, *Proceedings of the Queen's University 1979 Conference on Number Theory*, Queens Papers in Pure and Applied Mathematics, (54), pp. 379-420.
12. Liouvillian Solutions of  $n^{\text{th}}$  Order Homogeneous Linear Differential Equations, *Am. J. Math.*, **103**(4), 1981, pp. 661-682.
13. Elliptic Sectors at Singular Points of Planar Polynomial Vector Fields (with S. Schecter). Unpublished (after this paper was written, we discovered that the result had already appeared in print).
14. Elementary First Integrals of Differential Equations, *Transactions of the American Mathematical Society*, **279**(1), September 1983, 215-229 (with M. Prella).
15. An Extension of Liouville's Theorem on Integration in Finite Terms, *SIAM Journal of Computing*, **14**, 1985, 966-990 (with B. D. Saunders and B. F. Caviness).
16. Solving Homogeneous Linear Differential Equations in Terms of Second Order Linear Differential Equations, *Am. J. of Math.*, **107**, 1985, pp. 663-696.
17. Applications of Linear Groups to Differential Equations, *American Journal of Mathematics*, **107**, 1985 1093-1109 (with M. Tretkoff).
18. A Classification of Differential Equations of Fuchsian Class, *American Journal of Mathematics*, **107**, 1985 1111-1121 (with M. Tretkoff).
19. A Class of Vectorfields on  $S^2$  that are Topologically Equivalent to Polynomial Vectorfields, *Journal of Differential Equations*, **57**(3), 1985, 406-435 (with S. Schecter).

20. A Differentially Algebraic Elimination Theorem with Applications to Analog Computability in the Calculus of Variations, *Proceedings of the American Mathematical Society*, **94**(4), 1985, 635-658 (with L. Rubel).
21. Algebraic Relations Among Solutions of Linear Differential Equations, *Transactions of the American Mathematics Society*, **295**(2), 1986,753-763.
22. Elementary and Liouvillian Solutions of Linear Differential Equations, *Journal of Symbolic Computation*, **2**(3), 1986, 237-260 (with J. Davenport).
23. Algebraic Relations Among Solutions of Linear Differential Equations: Fano's Theorem, *Am. J. of Math.*, **110**, 1988, pp. 115-143.
24. Autonomous Functions, *Journal of Differential Equations*, **75**(2), 1988 (with L. Rubel).
25. Algebraic Properties of the Ring of General Exponential Polynomials, *Complex Variables Theory and Applications*, **13**, 1989, 1-20 (with C. W. Henson, L. Rubel).
26. An Outline of Differential Galois Theory, *Computer Algebra and Differential Equations*, E. Tournier, ed., Academic Press, 1989, 3-58.
27. Solving Ordinary Differential Equations in Terms of Series with Real Exponents, *Transactions of the A.M.S.*, **327**(1), 1991, 329-351, (with D. Yu. Grigor'ev).
28. Liouvillian Solutions of Linear Differential Equations with Liouvillian Coefficients, *J. of Symbolic Computation*, **11**, No. 3, 1991, pp.251-274.
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