

# Dan Zacharia

## Curriculum Vitae

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**Nationality:** US citizen.

### Education

1974 B.Sc. Mathematics, Hebrew University of Jerusalem  
1978 M.Sc. Mathematics, Brandeis University  
1981 Ph.D. Mathematics, Brandeis University  
Thesis advisor: Maurice Auslander.

**Research Interests:** Non Commutative algebra, Representations of algebras.

### Professional Experience

May 2015-July 2015	Visiting Scholar, Max Planck Institute for Mathematics, Bonn, Germany
Oct 2013-Dec 2013	Visiting Scholar, University of Bielefeld, Germany
May 2013-July 2013	Visiting Scholar, University of Kiel, Germany
May 2011-July 2011	Visiting Scholar, University of Bielefeld, Germany
May 2010-July 2010	Visiting Scholar, University of Bielefeld, Germany
May 2009-July 2009	Visiting Scholar, University of Bielefeld, Germany.
April 2009-May 2009	Visiting Scholar, University of Paderborn, Germany.
Aug 2004-Dec 2004	Visiting Professor at NTNU Trondheim, Norway.
Nov 2001-Dec 2001	Visiting Scholar, University of Murcia (Spain).
Sept 2001- Nov 2001	Visiting Professor at the NTNU (Norway).
Jan. 1997-May 1997	Visiting Professor, Virginia Tech University
Sept 1996-Nov 1996	Visiting Scholar, University of Sherbrooke.
1994- present	Professor, Syracuse University.
Sept 1991- Dec 1991	Visiting Scholar, Brandeis University.
1987- 1994	Associate Professor, Syracuse University.
1986- 1987	Assistant Professor, George Mason University.
1983- 1986	Van Vleck Assistant Professor, University of Wisconsin, Madison.
1981- 1983	Visiting Assistant Professor, Texas Tech University.
1976- 1981	Teaching Assistant, Brandeis University.

### Ph.D. Students

1. Peter Brown graduated 1993.

2. Jessica Levesque graduated 2004. (Ibrahim Assem and I were her joint advisors. She received her Ph.D. from the University of Sherbrooke).
3. Marju Purin graduated 2011.
4. Melissa Voldan-DiMarco (current Ph.D. student).

### External support

1. NSA grant H98230-05-1-0051. *Research in finite dimensional Koszul algebras*. November 2004-November 2006.
2. NSA grant H98230-07-1-0033. *Representation theory of Koszul algebras and their generalizations*. December 2006-December 2008.
3. NSA grant H98230-09-1-0061. *Homological aspects of Koszul and selfinjective algebras*. January 2009-January 2011.
4. NSA grant H98230-11-0152. *Homological aspects of finite dimensional selfinjective algebras*. January 2011-January 2013.
5. NSF grant DMS-1203469. *Interactions between Commutative Algebra and Representation Theory*. January 2012-December 2012.

**Editorial work:** Associate editor, Communications in Algebra. Term ended in December 2014.

### Articles in print.

1. *Algebras of finite global dimension* (with Dieter Happel), Algebras, quivers and representations. Springer Verlag, 2013, 95-113.
2. *A note on sheaves without self-extensions on the projective  $n$ -space* (with Dieter Happel), Proceedings of the AMS, Volume 141, Number 10, (2013) 3383-3390.
3. *On  $\Omega$ -perfect modules and sequences of Betti numbers* (with Otto Kerner), Proceedings of the 44th Symposium on Ring Theory and Representation Theory, Okayama, Japan (2012) 76-92.
4. *On modules of finite complexity over selfinjective artin algebras* (with Ed Green), Algebras and Representation Theory, vol 5, (2011), 857-868.
5. *Auslander-Reiten theory for modules of finite complexity over self-injective algebras* (with Otto Kerner) Bulletin of the London Mathematical Society **43** (2011) 44-56.
6. *Homological properties of piecewise hereditary algebras* (with Dieter Happel). Journal of Algebra **323** (2010), 1139-1154.
7. *Auslander-Reiten components containing modules with bounded Betti numbers* (with Ed Green). Transactions of the AMS **361**, Number 8, 2009, 4195-4214.
8. *A homological characterization of piecewise hereditary algebras* (with D. Happel). Mathematische Zeitschrift **260** (2008), 177-185.
9. *Noetherianity and Ext* (with E. L. Green, N. Snashall and O. Solberg). Journal of Pure and Applied Algebra **212** (2008) 1612-1625.

10. *Auslander-Reiten sequences, locally free sheaves and Chebyshev polynomials* (with Roberto Martínez Villa) *Compositio Math.*, **142** (2006), no. 2, 397--408.
11. *Finiteness of the strong global dimension of radical square zero algebras* (with Otto Kerner, Andrzej Skowronski and Kunio Yamagata); *Central European Journal of Mathematics* **2**(1) (2004), 103-111.
12. *On split-by-nilpotent extensions* (with Ibrahim Assem); *Colloquium Math*, **98** (2003), 259--275.
13. *Approximations with modules having linear resolutions* (with Roberto Martínez-Villa); *Journal of Algebra*, **266**, 671--697 (2003).
14. *Selfinjective Koszul algebras* (with Roberto Martínez-Villa), 5 pages. *Algebra Montpellier Announcements*, [01-2003], September 2003. (<http://www.mathematik.uni-bielefeld.de/~sek/fdlist.htm>)
15. *On the finiteness of the global dimension for artinian rings* (with Andrzej Skowronski and Sverre Smalø); *Journal of Algebra* **251**, 475-478 (2002)
16. *On endomorphism algebras with small homological dimensions* (with Mark Kleiner and Andrzej Skowronski); *Journal of the Mathematical Society of Japan* **54** (2002), no. 3, 621--648.
17. *Minimal projective resolutions* (with Edward L. Green and Oeyvind Solberg); *Transactions of the American Mathematical Society*, **353** (2001), no. 7, 2915--2939.
18. *Full embeddings of almost split sequences over split-by-nilpotent extensions* (with Ibrahim Assem); *Colloquium Math*, **81**(1999), 21-31.
19. *On modules with linear presentations* (with Edward L. Green, Roberto Martínez-Villa, Idun Reiten and Oeyvind Solberg); *Journal of Algebra* **205**, 578-604 (1998).
20. *On the Hochschild homology of quasi-hereditary algebras*; *Canadian Mathematical Society, CMS Conference Proceedings*, Volume **18**, 1996, 681-684.
21. *The cohomology ring of a monomial algebra* (with Edward L. Green), *Manuscripta Mathematica*, **85** (1994), 11- 23.
22. *Left monomial rings- a generalization of monomial algebras* (with W. Burgess, K. Fuller and E.L. Green), *Osaka Journal of Mathematics*, **30** (1993), 543- 558.
23. *Cyclic homology of monomial relations algebras* (with Kiyoshi Igusa), *Journal of Algebra*, **151** (1992), 502- 521.
24. *On the cohomology of the incidence algebra of a partially ordered set* (with Kiyoshi Igusa), *Communications in Algebra*, **18** (1990), 873-887.
25. *Remarks on Auslander algebras* (with Gordana Todorov), *Journal of Pure and Applied Algebra*, **70** (1991), 307- 314.
26. *Syzygy pairs in a monomial algebra* (with Kiyoshi Igusa), *Proceedings of the American Mathematical Society*, **108** (1990), 601-604.

27. *Special monomial algebras of finite global dimension*, Perspectives in Ring Theory, Kluwer (1988), 37-378.
28. *A characterization of algebras whose endomorphism rings have finite global dimension*, Proceedings of the American Mathematical Society, **104** (1988), 37-38.
29. *Auslander algebras of finite representation type* (with K. Igusa, M.I. Platzteck and G.Todorov), Communications in Algebra, **15** (1987), 377-424.
30. *Graded Artin algebras, rational series and bounds for homological dimensions*, Journal of Algebra, **10** (1987), 476-483.
31. *On Artin Rings of global dimension two* (with E.L. Green and W. Gustafson), Journal of Algebra, **92** (1985), 375-379.
32. *Projective resolutions over Artin algebras with zero relations* (with E.L. Green and D. Happel), Illinois Journal of Mathematics, **29** (1983), 180-190.
33. *On the Cartan matrix of an Artin algebra of global dimension two*, Journal of Algebra, **82** (1983), 353-357.
34. *Morphisms between preprojective modules over hereditary Artin algebras* (with George Wilson), Communications in Algebra, **11** (1983), 95-107.
35. *The preprojective partition for hereditary Artin algebras*, Transactions of the American Mathematical Society, **274** (1982), 327-343.

### Articles Submitted for publication

1. *On the diagonal subalgebra of an Ext algebra* (with E.L. Green, O. Solberg and N. Snashall).

### Invited talks since 2004.

2004. Algebra Seminar. University of Nebraska.
2004. *On the Auslander-Reiten quiver of the category of coherent sheaves over the projective  $n$ -space*. Special session in Representation Theory. Joint meeting of the AMS-SMM societies, Houston.
2004. *On the Auslander-Reiten quiver of the category of coherent sheaves over the projective  $n$ -space*. Invited talk at the Eleventh International Conference on Representations of Algebras. Mexico.
2004. *Linear modules over the exterior algebra and coherent sheaves over the projective  $n$ -space*. Algebra seminar. University of Paderborn, Germany.
2005. *Auslander-Reiten sequences, locally free sheaves and Chebyshev polynomials*. Oberwolfach, Germany.
2005. *Koszul algebras and their representations*. Algebra seminar. University of Paderborn, Germany.

2006. *Noetherianity and Ext*. Invited 40 minutes talk. Conference on Representation Theory and Related Topics. International Center for Theoretical Physics (ICTP), Trieste, Italy.
2006. *Representations of Koszul algebras*. Seminar, University of Ottawa.
2006. *Representations of Koszul algebras*. Conference on Rings and Categories of Modules. Brixen, Italy.
2007. *Auslander-Reiten components containing modules with bounded Betti numbers*. International conference on Representations of Algebras. Torun, Poland.
2008. Algebra Seminar. University of Sao Paolo.
2008. *Auslander-Reiten components containing modules with finite complexity*, Special session in Representation Theory, Joint AMS-SMS meeting in Shanghai.
2009. *Auslander-Reiten theory for modules of finite complexity over selfinjective algebras*. Invited 1 hour talk Workshop on cohomological methods in representation theory. Koln, Germany.
2009. Algebra Seminar. University of Paderborn.
2009. Algebra Seminar. University of Bielefeld.
2009. *Auslander-Reiten theory for modules of finite complexity over selfinjective algebras*. Special session in Representation Theory of Finite Dimensional Algebras, AMS meeting in Riverside.
2010. *Koszul algebras and applications to algebraic geometry*. Four one-hour lectures. Advanced school and Conference on Homological and Geometric Methods in Representation Theory. International Center for Theoretical Physics (ICTP), Trieste, Italy., January 2010.
2010. Algebra Seminar. University of Bielefeld.
2011. Two one-hour lectures at the Japan Symposium on Rings and Representations of Algebras in Okayama in September.
2011. Plenary talk at an international meeting on representations of algebras in Shanghai in October.
2011. Three invited one hour talks at the Zhejiang Normal University in October.
2011. Algebra seminar. Zhejiang University.
2011. Invited talk at a special session in representation theory at the CMS meeting in Toronto in December.
2011. Algebra Seminar. University of Bielefeld.
2012. Plenary talk. International conference on representations of algebras. Bielefeld.
2013. Talk at the Conference in memoriam of Dieter Happel. Chemnitz.
2013. Algebra Seminar. University of Kiel.
2013. Algebra Seminar. University of Stuttgart.

2013. Algebra seminar. University of Glasgow, Scotland.

2013. Representation theory seminar. University of Bielefeld.

2013. Major speaker at the International conference on Perspectives of representation theory of algebras".  
University of Nagoya, Japan.

2014. Algebra Seminar. University of Georgia.

2014. Invited talk at a special session on Homological Methods in Algebra at the AMS meeting in Lubbock, T

2014. Invited talk at the Montreal ARTA conference in Representation Theory.

2015. Representation Theory seminar. University of Bonn.

### **Other professional activities.**

1. Referee for professional journals. (Advances in Mathematics, Bulletin des Sciences Mathematiques, Indian Journal of Mathematics, Israel Journal of Mathematics, Journal of Algebra, Communications in Algebra, Journal of Pure and Applied Algebra, Nagoya Journal of Mathematics, Transactions of the American Mathematical Society, Proceedings of the American Mathematical Society, Pacific Journal of Mathematics, Bulletin of the Canadian Mathematical Society, Colloquium Math. and others).

2. Reviewer for Mathematical Reviews.

3. Served on NSF panel for Graduate fellowships.

4. Referee for NSF, NSA, NSERC and FCAR grant proposals.

5. Organizer with Mark Kleiner of a Special Session in representations of finite dimensional algebras at the regional AMS meeting in Syracuse in September 1993.

6. Organizer with Ellen Kirkman of a Special Session in Rings and Modules at the regional AMS meeting in Baton Rouge in April 1996.

7. Organizer with Martha Takane of a Special Session in Representations of Algebras and Groups at the joint AMS-SMM meetings in Oaxaca, Mexico, December 1997

8. Organizer with Ed Green, Birge Huisgen-Zimmermann and Alex Martsinkovsky of a Special Session in representations of algebras at the AMS regional meeting in Santa Barbara in April 2005.

9. Organizer with Frauke Bleher and Birge Huisgen-Zimmermann of a Special Session in representations of algebras at the AMS regional meeting in Tucson in April 2007.

9. Organizer with Srikanth Iyengar, Graham Leuschke and Claudia Miller of a conference on the interactions between commutative algebra and representation theory in Syracuse in April 2012.