

**Curriculum Vitae**  
**Anatoly S. Libgober**

NSF and Department of Mathematics, UIC.

**Conferences and Invited Lectures**

**2018**

Invited Speaker: Characteristic classes and Singularities, Geneva, Switzerland, October 6.

Invited Speaker: F-theory workshop, Harvard University, Cambridge, Mass. September 29-30.

Invited Speaker, Hirz90, Conference in honor of Professor Hirzebruch, Bar-Ilan University, Israel. June 20.

Invited Speaker, Singularities, Toric Geometry and Differential Equations, Chemnitz (Germany), March 20.

**2017**

Invited Speaker: Conference on Singularities, Real Geometry and beyond, Eilat, Oct.17.

Invited Speaker: Conference on Topology of Arrangements in honor of M.Salvetti, Inst. di Giorgi, Pisa, June 8.

Algebraic Geometry Seminar, University of Miami, April 19.

Invited Speaker: Singularities at Midwest, Madison, Wis. March 17

Algebraic Geometry Seminar, Dijon, Feb 2.

Invited speaker at Meeting of Spanish Math. Soc. Session of Geometric Topology, Zaragoza, Spain, Jan 20.

**2016**

Invited speaker at program at Fields Institute (Toronto) and lecture on workshop on Stratified spaces and M-theory. Aug. 21.

Invited speaker at conference on arrangements and applications held in Sapporo, Japan, Aug. 1.

Invited Speaker at workshop: “Global singularity theory and curves” EPFL, Lausanne, Switzerland, May, 11.

Invited speaker at workshop “Singularities and Applications”, University of Liverpool, Liverpool, UK, April 2.

Invited speaker at conference “Singularities at Midwest III”. Univ. of Wisconsin, Madison, Wisc. March 21.

## 2015

Invited Speaker at Conference on Moonshines, Mock Modular forms and String theory. Aug 3-13, Univ, of Durham, UK.

Speaker at AMS Summer Institute on Algebraic Geometry, Salt Lake City, July 16.

Invited Speaker, Conference in Honor of V.Lin, Technion, Haifa, Israel, May 20.

Seminar Talk, University of Vienna, Vienna, Austria, May 11.

Seminar Talk, University of North Carolina, Chapell Hill, April 10.

Invited speaker, Conference in Honor of J.Shaneson's 70th birthday. Madison, Wisc. Mar.30.

Lectures on conference on arrangements of hyperplanes and plane curves, Tokyo Metropolitan University, Tokyo, Japan, March 13,14. 2015.

Speaker at Seminar on Mathematics and String theory: Institute of Mathematics of Physics of Universe, Tokyo, Japan. March 10, 2015.

Speaker: Seminar on Homotopy Algebra, UIC, Jan 16, 2015.

## 2014

Invited speaker, Workshop on Singularities in geometry, foliations and dynamics, A Conference in honor of 60th birthday of Prof.Seade, Dec. 8-16, Merida, Mexico

Colloquium speaker, FSU, Tallahassee, Florida, Nov. 21.

Invited speaker at Geometry seminar, Florida State University, Tallahassee, Florida, Nov.20.

Invited speaker at Geometry seminar, Univ. of Wisconsin, Madison, WI, Oct.31.

Colloquium Speaker, Univ. of Miami, Oct. 28 Miami Fl.

Colloquium Speaker, Univ. of Geneva, Oct. 3. Geneva, Switzerland.

Invited Speaker at Geometry Seminar, Univ. of Geneva, Oct.1. Geneva, Switzerland.

Invited Speaker on conference "Modular Invariants in Topology and Analysis", Sept. 9. Regensburg, Germany.

Invited speaker on "Symposium on singularities and their topology". University of Hannover, Hannover, Germany, July 15.

Invited lecture at workshop during AMS special session on Physics and Singularities, Knoxville, Tenn. March 22.

## 2013

Invited talk at University of Hong Kong conference on geometry, Nov. 30, 2013.

Minicourse of topology of quasi-projective manifolds, University of Hong Kong, Nov. 2013.

Invited Talk at Algebraic Geometry Seminar, KIAS, Seoul, S.Korea. Nov. 20, 2013.

Invited talk at conference "Arrangements and Characteristic Classes", RIMS, Kyoto, Nov.14, 2013

Invited talk at "Algebra, Geometry and Topology of singularities", Madrid Sept, 2013.

Invited talk at "Singularities in geometry and applications III" Edinburgh, Sept. 2013.

Invited talk at conference of "Motivic Invariants and Singularities", Univ. of Notre

Dame, South Bend, IN, June 3.

Invited talk at AMS Special session on Stratified Spaces. Boulder, CO. April 21.

Colloquium: Western Michigan University, Kalamazoo, MI, Feb. 21.

Seminar talk: University of Wisconsin, Madison, Wisconsin. Jan 25.

Seminar talk: Tel-Aviv University, Tel-Aviv, Israel, Jan 2.

## 2012

Seminar Talk: University of Zaragoza, Zaragoza, Spain, October 17.

Seminar Talk: University of Bordeaux, Bordeaux, France. October 5.

Invited Speaker, Singularities, Oberwolfach, September 26.

Invited Talk, Conference in Honor of Prof. S.Abhyankar, Purdue Univ, IN. July 6.

Seminar Talk, University of Bourgogne, Dijon, France,

Seminar Talk, University of Grenoble, Grenoble, France, June 18, June 21.

Invited Talk, School "Arrangements in Pyrenees". Pau, France. June. 14.

Seminar Talk, University of Philadelphia, Philadelphia, PA, May 2.

Seminar Talk, University of Michigan, Ann Arbor, MI. April 19.

Invited Talk, Singularities at Madison II, March 22-24.

Invited talk, AMS Special Session on "Topology of stratified spaces" Hawaii, March 3-4.

## 2011

Seminar Lecture, Number theory seminar UIC, Sept.12.

Invited Talk, Conference on arrangements of hyperplanes, Vancouver, Canada, 08/08-08/12.

Invited Talk, Conference of Topology of Singular Spaces, Hefei, China, July.

Seminar Lecture, Purdue University, W.Lafayette, IN, May 12.

Colloquium, Department of Mathematics, University of Minnesota, April 21.

Seminar lecture, University of Zaragoza, Spain, April 5.

Colloquium, Department of Mathematics, Univ. of S. California, Los Angeles, Ca. February 16.

Invited talk on seminar of algebraic geometry, Madison. January 28.

## 2010

Invited talk at "Knots in Chicago", UIC (September)

Algebraic Geometry seminar at University of Miami, Coral Gables, Florida (August)

Invited talk on conference on Braid Groups, Di Giorgi Institute, Pisa, Italy (June).

Speaker and organizer (jointly with J.Seade and D.Eisenbud) of session on Singularities and Algebraic Geometry. Berkeley, US-Mexico joint AMS meeting (June).

2010 Speaker for Annual "Moursund Lectures", University of Oregon, (April).

Invited speaker for workshop on topology of stratified spaces. Univ. of Madison, Wisc. (March 2010).

## 2009

Midwest Algebraic Geometry conference in honor of 60th birthday of A. Libgober.  
Arrangements of Hyperplanes, Conference at Hokkaido University, Sapporo, Japan.  
(August).

Conference of Algebraic Topology, Warsaw, Poland. (July)

Topology of Algebraic Varieties, A Conference in Honor of the 60th Birthday of  
Anatoly Libgober, Jaca, Spain. (June)

## 2008

University of Marseille, France, (November) Multivariable Hodge theoretical invariants of germs of plane curves.

University of Bordeaux, France (October), Recent developments in Hodge theory

University of Nice, France (October), Deligne extensions and local systems.

MSRI, Berkeley. (September) Chern numbers of singular varieties. Workshop  
“Topology of Stratified Spaces”.

## 2007

University of Chicago (January) Non vanishing loci of Hodge numbers of local systems.  
Algebraic Geometry Seminar.

East China University (Shanghai), Hangzhou University, University of Xiamen,

Xiamen, China (May) Four lectures, including one at Conference on Several Complex  
Variables.

## 2006

Purdue University, Indiana, (December), Alexander Invariants in Algebraic Geometry.  
Midwest algebraic geometry conference.

Cincinnati, Ohio (October). Higher elliptic genera. AMS Midwest regional meeting.

Oberwolfach (Germany), Sept. “Higher Elliptic Genera”. Workshop on Singularities.

Segovia (Spain) August. Elliptic genus in Algebraic Geometry. ICM Satellite conference on Algebraic Geometry.

New York, (Courant Institute), March. Generalizations of elliptic genera, Topology Seminar.

## 2005.

Madison (Wisconsin), November,  $\mathbf{Z}_2$  invariants of Kahler varieties. Algebraic Geometry Seminar, University of Wisconsin.

Trieste (Italy), August, School on Singularities, Course on Topology of Complements.

Seattle (Washington), July, Summer Institute on Algebraic Geometry. Complements to Ample divisors.

Lumini (France) January, School on Singularities, Series of five Lectures on Complements to Singular Divisors .

## 2004

Northwestern Univ.(Evanston, Ill), October, Elliptic genus of singular varieties.

Lumini (France), July, Sao Carlos conference on Singularities, Orbifold elliptic genus.

Univ. Complutense, Madrid (Spain), July, Topology of isolated normal crossings.

Lumini (France), May, Conference in honor of Monique Lejean-Jalabert. Isolated non normal crossings.

Purdue Univ. (Indiana). April, Two lectures on elliptic genera in algebraic geometry. Algebraic Geometry seminar.

## Publications

1. Numerical characteristics of systems of straight lines on complete intersections, *Math. Notes (Transl.)* 13 (1973), 51-56.

2. Topology of algebraic hypersurfaces. (Thesis, Tel-Aviv University, Aug. 1977, in Hebrew)

3. A geometrical procedure for killing the middle dimensional homology groups of algebraic hypersurfaces, *Proc. Amer. Math. Soc.* 63 (1977), 198-202.

4. On the fundamental group of the space of cubic surfaces, *Math. Z.* 162 (1978), 63-67.

5. On the topology of some even-dimensional algebraic hypersurfaces, *Topology* 18 (1979), 217-222.

6. Some properties of the signature of complete intersections, *Proc. Amer. Math. Soc.* 79 (1980), 373-375.

7. Congruences modulo powers of 2 for the signature of complete intersections, (with J. Wood and D. Zagier), *Quart. J. Math., Oxford Ser. (2)* 31 (1980), 209-218.

8. Diffeomorphic complete intersections with different multidegrees (with J. Wood), *Bull. Amer. Math. Soc. (new series)* 2 (1980), 459-461.

9. Levine's formula in knot theory and quadratic reciprocity law, *L'Enseignement Math.* 26 (1980), 323-331.

10. Algebraic Geometry, Proceedings of the Midwest Algebraic Geometry Conference held in University of Illinois at Chicago Circle, Chicago, Ill, May 2-3, 1980, Edited with P. Wagsreich, *Lecture Notes in Math.* 862, Springer Verlag.

11. On the fundamental group of the complement to a discriminant variety, (with I. Dolgachev), *Proc. Midwest Algebraic Geometry Conf., U.I.C.C., Chicago, May 1980*, Springer-Verlag *Lecture Notes in Math.* 862 (1981), 1-25.

12. On the topological structure of even-dimensional complete intersections, (with J. Wood), *Trans. Amer. Math. Soc.* 267 (1981), 637-660.

13. Differentiable structures on complete intersections I, (with J. Wood), *Topology*, 21 (1982), 469-482.
14. Alexander polynomial of plane algebraic curves and cyclic multiple planes, *Duke Math. J.* 49 (1982), 833-851.
15. Alexander invariants of plane algebraic curves, *Proc. Summer Inst. on Singularities*, Humboldt State Univ., Arcata, Cal., July 1981, *Proc. Symp. Pure Math.* 40 (1983), Part 2, 135-143.
16. Differentiable structures on complete intersections II, (with J. Wood), *Proc. Summer Inst. on Singularities*, Humboldt State Univ., Arcata, Cal., July 1981, *Proc. Symp. Pure Math.* 40 (1983), Part 2, 123-133.
17. Alexander modules of plane algebraic curves, *Proc. Low-Dimensional Topology Session*, San Francisco, 1981, *Contemp. Math.* 20 (1983), 231-247.
18. A characterization of plane curve singularities with one characteristic pair, *American Journal of Math.* 106 (1984), 505-507.
19. Homotopy groups of the complements to singular hypersurfaces, *Bull. Amer. Math. Soc.* 13 (1985), 49-51.
20. On  $\pi_2$  of the complements to hypersurfaces which are generic projections, *Adv. Stud. Pure Math.* 8 (1986), 229-240.
21. Remarks on the moduli spaces of complete intersections, (with J. Wood), *Proc. of S. Lefschetz Symp. in Mexico City*, *Contemp. Math.* 58, Part I, (1986), 183-194.
22. On homotopy type of the complement to plane algebraic curves, *J. reine angew. Math.* 367 (1986), 103-114.
23. Fundamental groups of the complements to plane singular curves, *Proc. A.M.S. Research Summer Institute on Algebraic Geometry*, Bowdoin, Maine, July 1985, Vol. 46 (1988), 28-45.
24. Braids. *Proceedings of AMS-IMS-SIAM Joint Summer Research Institute, in Mathematics Sciences on Artin's Braid Groups* held University of California, Santa-Cruz, California, July 13-26, 1986. (Editor with Joan Birman). *Contemporary Mathematics*, 1988.
25. On divisibility properties of braids associated with algebraic curves, *Proc. A.M.S. Research Institute on Artin's Braid Groups*, Santa Cruz, July 1986, *Contemp. Math.* 78 (1988), 387-398.
26. Theta characteristics of singular curves, spin structures, and Rohlin's theorem, *Ann. Sci. Ecole Normale Sup.* (4) 21 (1988) 623-635.
27. Invariants of plane algebraic curves via representations of braid groups, *Invent. Math.* 95 (1989), 25-30.
28. On topological complexity of solving polynomial equations of special type, *Proceedings of the 7th Army Conf. on Applied Math. and Computing*, pp. 475-479.
29. Uniqueness of the complex structures on Kähler manifolds of certain homotopy types, (with J. Wood), *J. Differential Geom.* 321 (1990), 137-154.
30. An obstruction for smoothing of Gorenstein surface singularities, (with S. Yau), *Comment. Math. Helv.* 65 (1990), 413-433.
31. On the homology of finite abelian coverings, *Topology and Appl.* (vol 43) (1992) p.157-166.

32. On groups which cannot be realized as fundamental groups of complement to hypersurfaces in  $\mathbf{C}^n$ . Algebraic Geometry and Its applications. C.Bajaj Editor. Springer Verlag, 1994 (S. Abhyankar 60-th birthday volume.)
33. Topological invariants of affine hypersurfaces: connectivity, ends and signature, Duke Math. Journal. vol 70, 1993.
34. Homotopy groups of the complement to singular hypersurfaces II, Annals of Mathematics, 139 (1994) pp. 119-145.
35. On the zeta-function of monodromy of a polynomial map, (with S. Sperber). Compositio Math (1995) vol. 95, pp.287-307.
36. Position of singularities of hypersurfaces and the topology of their complements, J.Math. Sci. vol. 82 (1996).
37. Lines on Calabi Yau complete intersections, mirror symmetry and Picard Fuchs equations. (with J.Teitelbaum) Duke Math. Journal vol 69, No 1, 1993.
38. Differential forms on complete intersections and related quotient module, Proc. of Conf. on Algebraic Geometry in honor of Prof. Hirzebruch in Bar Ilan University during May 1993) Israel Math. Conf. Proceedings.vol. 9, 1996.
39. Automorphisms of desingularizations of quotients and equivariant McKay correspondence. C.R. Acad. Sci. Paris, Ser. I Math. vol. 323 (1996), no. 8, p. 907-912.
40. Singularities and Complex Geometry, Proceedings of the Seminar held in Beijing in June 1994, AMS/IP Studies in Adv. Math. vol. 5 Amer. Math. Soc. Providence, R.I. 1997.
41. The topology of complements to hypersurfaces and non vanishing of a twisted de Rham cohomology. Proc. US-China seminar of Singularities and Complex Geometry. AMS/IP Studies in Advanced Math. Amer. Math. Soc. Providence, R.I. 1997.
42. Abelian branched covers of projective plane, Proc. Conf. in honor of Prof. C.T.C. Wall, Cambridge Univ. Press. p.281-290. W.Bruce and D.Mond, editors.
43. Characteristic varieties of plane algebraic curves. In Applications of Algebraic Geometry to coding theory, physics and computations. Edited by Ciliberto, Hirzebruch, Teicher and Miranda. NATO Science series. Kluwer, 2001. p. 215-254.
44. Chern classes and the periods of mirrors, Math. Res. Letters, vol.6, 141-149, 1999.
44. Cohomology of Orlik-Solomon algebra and local systems (with S.Yuzvinski), Compositio Mathematica, 121, 337-361, 2000.
46. Cohomology of local systems (with S.Yuzvinski), Adv. Studies in Pure math. Proc. of Conference of Arrangements, North Holland, 2001.
47. Zariski-Van Kampen theorem for homotopy groups. (with D.Cheniot) Journ. Math. Jussieux. 2 (2003), no. 4, 495-527.
48. Elliptic genera and applications to mirror symmetry (with L.Borisov) Inventiones Math. vol.140, p.453. (2000).
49. Hodge decomposition for Alexander invariants Manuscripta Math. 107 (2002), no. 2, 251-269.
50. First order deformations for rank one local systems with non vanishing cohomology Topology Appl. 118 (2002), no. 1-2, 159-168.
- 51 Homotopy groups of the complements and non isolated singularities. (with M.Tibar) IMRN, 2002, no.17, p.871-888.

52. Trends in Singularities, Editor (with M.Tibar). Collection of papers in Singularities theory. Birkhauser Verlag, series "Trends in Mathematics" due: March 2002.
53. Eigenvalues for the monodromy of the Milnor fibers of arrangements, Trends in Singularities, Birkhauser.
54. Generalizations of the odd degree theorem and applications (with S.Friedland). Israel Journal of Math. 136 (2003) 353-371.
55. Singular elliptic genus. (math.AG/0007108 with L.Borisov) Duke, Math. J. vol.116. n.2, 2003.
56. Elliptic genera of singular varieties, orbifold elliptic genera and chiral deRham complex math.AG/0007126, (with L.Borisov). Proc. of Montreal workshop on String Theory. D.H.Phong and E.D'Hoker editors.
57. McKay correspondence for elliptic genera (with L.Borisov). Annals of Mathematics, 2005, vol 161. (math.AG/0206241).
58. Isolated non normal crossings. Contemp. Math. vol.354. 2004. T.Gaffney and M. Ruas editors. (math.AG/0211264)
59. Local topology of reducible divisors (with A.Dimca). (math.AG. 0303215) to appear in Proc. of San-Carlos-Lumini workshop on Real and Complex singularities.
60. Homotopy groups of complements to ample divisors, to appear in Proc. of Conference on Singularities in Sapporo, Japan, 2003. math.AG/0404341
61. Counting rational maps onto surfaces and fundamental groups (with T.Bandman). International Journal of Mathematics, vol 15, No.7, Sept. 2004, p.673-690. (math.AG/0405018).
62. Regular Functions Transversal at Infinity, (with A.Dimca), math.AG/0504128, Tohoku Math. Journal. 2006.
63. Discrete torsion, orbifold elliptic genera, and the chiral de Rham complex (with M.Szczesny) Volume in Honor of R.MacPherson, Pure Appl. Math. Q. 2 (2006), no. 4, part 2, 1217–1236. math.AG/0412422.
64. Lectures on the topology of the complements and the fundamental groups. Singularity theory, 71–137, World Sci. Publ., Hackensack, NJ, 2007.
65. Higher Elliptic Genera (with L.Borisov) Math. Res. Lett. 15 (2008), no. 3, 511–520.
66. Problems in the topology of the complements, Singularities in geometry and topology, 370–387, World Sci. Publ., Hackensack, NJ, 2007.
67. Hodge genera and characteristic classes of complex algebraic varieties. (with S. Cappell, L.Maxim and J.Shaneson) Electron. Res. Announc. Math. Sci. 15 (2008), 1–7.
68. Non vanishing loci of Hodge numbers of Local systems, Manuscripta Math. vol.129, p.1-31, 2009.
69. Cohomology of bundles on homological Hopf manifold, Science in China, Ser. A52 (2009) n.12. 2588-2698.
70. Hodge Genera of Algebraic Varieties II (with S.Cappell, L.Maxim and J.Shaneson) arXiv:math/0702380 Math. Annalen, 345 (2009), 925-972.
71. Multivariable Hodge theoretical invariants of germs of plane curves I (with P.Cassou Nogues). J. Knot Theory Ramifications 20 (2011), no. 6, 787805,



72. Elliptic genera, real algebraic varieties and quasi-Jacobi forms, (arXiv 0904.1030). *Topology of Stratified Spaces*, Proceeding of MSRI conference. G.Friedman, E.Hunsicker, A.Libgober and L.Maxim Editors. Cambridge University Press, 2011.
73. Hodge polynomials of singular hypersurfaces (with L.Maxim) *Michigan J. of Math.* vol.60 (2011) p.661-673.
74. Development of the theory of Alexander invariants in algebraic geometry. *Development of the theory of Alexander invariants in algebraic geometry. Topology of algebraic varieties and singularities*, 317, *Contemp. Math.*, 538, Amer. Math. Soc., Providence, RI, 2011,
75. Sequences of LCT polytopes (with M.Mustata) arXiv 1002.4163; *Math. Res. Letters*. vol.18 (2011) p.733-746.
76. Mordell-Weil groups of elliptic threefolds and the Alexander module of plane curves. *J. Reine Angew. Math.* 697 (2014), 1555.
77. On combinatorial invariance of the cohomology of Milnor fiber of arrangements and Catalan equation over function field (Proceeding of Conference on arrangements of hyperplanes, Sapporo, Japan, to appear).
78. *Topology of Stratified Spaces*, Proceeding of MSRI conference. Coedited with G.Friedman, E.Hunsicker and L.Maxim. Cambridge University Press, 2011.
79. Characters of fundamental groups of curve complements and orbifold pencils (with E.Artal-Bartolo and J.I.Cogolludo-Agustin) *Characters of fundamental groups of curve complements and orbifold pencils. Configuration spaces*, 81109, CRM Series, 14, Ed. Norm., Pisa, 2012. (arXiv:1108.0164.)
80. On Mordell-Weil group of isotrivial abelian varieties over function fields. *Math. Annalen*, vol.357 p.605-629 (2013).
81. Factors of Jacobians and isotrivial elliptic surfaces, *Journal of Singularity Theory*, Vol 5 (2012), p.115-123,
82. Depth of cohomology support loci for quasi-projective varieties via orbifold pencils (with. E.Artal-Bartolo and J.I.Cogolludo-Agustin), *Rev. Mat. Iberoam.* 30 (2014), no. 2, 373-404.
83. Multivariable Hodge theoretical invariants of germs of plane curves II (with P.Cassou Nogues) *Valuation Theory in INteractions*, A.Camplillo F.V.Kuhlmann, B.Tessier editors, p.82-135, EMS, 2014.
84. Albanese varieties of cyclic covers of plane and orbifold pencils (with E.Artal-Bartolo and J.I.Cogolludo-Agustin). *Nagoya Journal of Mathematics*, 227, (2017), p.189-213.
85. *Topology of algebraic curves* [book review of book by A.Degtyarev]. *Bull. Amer. Math. Soc. (N.S.)* 51 (2014), no. 3, 479-489.
86. Albanese varieties of abelian covers. *Journal of Singularities*, 12 (2015) p.105-123.
87. Preface to the special volume “Arrangements at Pyrenees”, *Annales de la faculté des sciences de Toulouse Sr.* 6, 23 no. 2: Numro Special occasion de la conférence Arrangements in Pyrnes, Pau 11-15 juin 2012 (2014), p. i-ii
88. Elliptic genera of phases of  $N=2$  theories, 18p. arXiv:1410.0168, *Communications in Math. Physics.* 340 (2015), no. 3, 939-958.

89. Motivic infinite cyclic covers (with Manuel Gonzalez Villa and Laurentiu Maxim), 27 pages, arXiv:1411.2320
90. Stringy  $E$ -functions of Pfaffian-Grassmannian double mirrors (with Lev Borisov). arXiv:1502.03702. accepted, to appear in *Compositio Math: Algebraic Geometry*.
91. Strata of discriminantal arrangements, (with S. Settepanella), arXiv:1601.06475, to appear, *Journal of Singularities*.
92. Motivic zeta functions of infinite covers (with M.Gonzalez-Villa and L.Maxim), to appear in *Proceedings of Conference in honor of Prof. L.Ein. Local and global methods in algebraic geometry*, 117141, *Contemp. Math.*, 712, Amer. Math. Soc., Providence, RI, 2018.
93. Elliptic genus of singular algebraic varieties and quotients. *J. Phys. A* 51 (2018), no. 7, 073001, 33 pp.