

# CURRICULUM VITAE (April 2015)

## Personal data

Name: Michael Tsamparlis

Place and date of birth: Athens, 3 May 1948

Address: 21 Panionias Street, Athens GR 16561, Glyfada, Greece.

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## Academic Degrees

- 1967-1972: BSc Physics Department, University of Athens
- 1972 - 1974 IMPERIAL COLLEGE, UNIVERSITY OF LONDON, UK. DIPLOMA OF IMPERIAL COLLEGE (D.I.C) in Theoretical Physics.  
Thesis: “The concept of connection from Euclid to Ehreshman” (1973 Imperial College, Theoretical Physics Department.
- 1974 - 1977 Ph.D., Imperial College, University of London.  
Thesis: “The modifications of General Relativity due to the presence of Torsion”.

## Academic positions

- 1978 Lecturer, Physics Department, University of Athens, Greece
- 1988 - 2007 Assistant Professor, Physics Department, University of Athens, Greece
- 2009 Associate Professor, Physics Department, University of Athens, Greece
- 2015 Professor, Physics Department, University of Athens, Greece

## International scientific experience

### Organization of international meetings

- 1983 Member of the Organizing Committee of the “First International Symposium on Solar Energy” organized by EC in Amsterdam.
- 1995 Member of the Organizing Committee of the Symposium “Physics Studies in Tomorrow’s Europe” (Ghent, Belgium) organized by EC.

## **Invited speaker**

- 1995 Address of the European symposium organized by EC with title “Physics Studies in Tomorrow’s Europe” (Ghent, Belgium) with subject: Physics and Industry.
- 1998 Address the international Symposium “11th International Drying Symposium (IDS 98)” Halkidiki, Greece, August 19 -22 1998 with subject: Applications of drying in agricultural industry.

## **Panelist**

“11th International Drying Symposium (IDS 98)” Halkidiki, Greece, August 19 -22 1998.

## **International distinctions**

- 1985 Honourable Mention in the “Gravity Research Foundation” with the paper “Spacelike Congruencies in General Relativity”.

## **Patents**

- 1992 European patent on the drying of fruits and vegetables. Classification: F26B 3/28, F26B 15/16, F26B 25/06.

## **International consultant**

I am an international expert (consultant) on the drying of fruits and vegetables through the program USAID. In these activities I have taught:

- The drying of apricots to Afghan extension workers in Pakistan.
- The drying of tropical fruits in Uganda (twice). The second time I cooperated with the Postharvest Institute For Perishables, University of IDAHO, USA.

## **Applied Research Projects**

I have completed a number of (financed) applied research projects in the area of drying and solar energy. In those programs I was the scientific and technical manager. The titles of the programs are:

- 1. EOMMEX (Greek Innovation Center)  
Construction and evaluation of a solar batch dryer (1987).
- 2. European Union (DG XII)  
Construction and testing of an air collector test loop  
ESA-R-136 GR (1.1.1982-31.12.1982)
- 3. General Secretariat of R and D.

- 1) PROPE.  
Drying of agricultural products in a solar cabinet dryer with discontinuous drying operation  
3500 EPE/530/8-4-1987
- 2) Program of Industrial Research (PABE).  
A new solar cabinet dryer  
323 ERE/54/16-1-1987
- 3) PENED.  
Objective drying curves and optimization of convective drying.  
3472 ERE/986/31-3-91
- 4) EPET III  
Development of Drying Stations for the production of a new type of natural raisin and other fruits.  
No. 290. 1997.

## Academic Experience

### Taught courses

#### Undergraduate Level

- 1978-1985 Theoretical Mechanics
- 1980 (Summer) Department of Applied Mathematics and Computer Science, University of Witwatersrand, Johannesburg, South Africa:  
Differential Equations, Dynamical Systems and Linear Algebra.
  - a. 1985 - 2001 Theory of Special Relativity
  - b. 1986 - 2014 Theory of General Relativity, Cosmology, Relativistic fluid dynamics  
Lie symmetries of differential equations with applications.

#### Postgraduate Level

- 1979 (Summer) Department of Applied Mathematics and Computer Science, University of Witwatersrand Johannesburg, South Africa:
  - a. Differential Geometry and the General Theory of Relativity
  - b. Differential Forms and Applications
- 1996 - 2014 General Relativity, Cosmology.
- 2000 - 2001 Series of lectures on “Lie symmetries of differential equations and their applications”

## **Ph.D. supervision**

- Emmanouil Saridakis  
“ The kinematic and the dynamic analysis of a general collineation” (1995)
- Pantelis Apostolopoulos  
Higher order symmetries in General Relativity (2003)
- Andronikos Paliathanasis  
“ Dynamics Lie symmetries and Physics” (2013)

## **International activity**

- 1982 - 1988 Member of the International Society of Solar Energy (I.S.E.S.).
- 1984 - 1988 Member of the ”Systems and Collector Testing Group” of the European Community representing Greece and the University of Athens.
- 1992 - Member of the International Astronomical Society
- 1993 - 1998 Elected member of the Mobility Committee for the European exchange of Physics students (EMSPS) organized by the European Physical Society. Regional coordinator for the Balkans and the Eastern Mediterranean.

## **Other scientific activities**

Organizing international meetings

- 1983 Member of the organizing committee of the First Congress on Solar Energy organized by EC in Amsterdam.
- 1993 Organization of the third meeting ”New Developments in Gravitation” (NEB) of the Greek relativists in Athens
- 1995 Member of the organizing committee on the congress ”Physics Studies in Tomorrow’s Europe Gent” organized by EC in Belgium.

## **Invited speaker**

- 1995 Presentation in the congress ”Physics Studies in Tomorrow’s Europe Gent” organized by EC with subject ”Industrial Physics”.
- 2006 Invited speaker in the 12th Congress on the ”New Developments in Gravitation” (NEB) held in Nafplion with topic ”Application of symmetries in General Relativity”
- 2014 Invited speaker at the 2nd congress ”Symmetries, Differential Equations and Applications (SDEA – II)” Islamabad, Pakistan with subject ”Lie and Noether symmetries of second order differential equations and their geometrization”

## **Distinctions**

- 1985 Honorable Mention in Gravity Research Foundation with the essay "Space-like Congruences in General Relativity".

## **International expert on drying**

I have been working as an international consultant (under contract) a few times for the program USAID of State Department (USA). This program is designed to give expert assistance to third world countries in the food sector. In this activity I have introduced solar drying to groups in Pakistan and Uganda.

## **Publications**

### **Books**

1. "The Theory of Special Relativity: Part A, Mathematical Methods"  
Athens 2004 (in Greek)
2. "The Theory of Special Relativity: Part B, The Physics"  
Athens 2006 (in Greek)
3. "Solar drying of apricots" publication made on behalf of the program USAID for the Afghan and Pakistan producers/extension workers (translated into the local languages from English) (1994).
4. "Special Relativity"  
Springer, 2010.

### **Reports in International Conferences**

1. "Differential Rotation of an Electrically Conducting Fluid in General Relativity"  
South African Math. Soc.:Notices 12(1980),231  
M. Tsamparlis and D.P. Mason
2. "Spacelike Congruences" South African Math. Soc. Notices 13(1981), 209  
D.P. Mason and M. Tsamparlis
3. "Spacelike Congruences in General Relativity: Theory and Applications" 10th International Conference on General Relativity and Gravitation, Pavoda 4-9 July 1983, Vol. 1, pp 143-146  
M. Tsamparlis and D.P. Mason
4. "A Physical Classification of Spatially Homogeneous Space-Times" International Conference on General Relativity and Gravitation, Pavoda 4-9 July 1983 Vol. II, pp.873-875  
M. Tsamparlis and E. Saridakis

5. "Spacelike Symmetries in Fluid Space-Times" in South African Math. Soc., Notices 16(1984), 226  
D.P. Mason and M. Tsamparlis
6. "Drying of Grapes in Cabinet Solar Dryer-Preliminary Results" First EC Conference on Solar Heating, Amsterdam 30April-4 May 1984  
M. Tsamparlis, M. Marousis, G. Rauzeos
7. " Spacelike Congruences in General Relativity" Gravity Research Foundation (1985)  
M. Tsamparlis
8. "A pilot Scale Solar Dryer" International Conference on Solar Energy, Salonica 6-9 November 1985  
M. Tsamparlis, M. Marousis
9. "A Solar Batch Dryer for Agricultural Products" Solar Drying of Agricultural Products, Proceedings of CNRE Technical Meeting organized by FAO at Stuttgart, FRG, 9-11 September 1987  
M. Tsamparlis
10. "A Hybrid Solar Dryer" Colloque International, Energy Innovation and the Agro-Food Industry, organized by the EC and AFME, Amiens, 21-23 March 1990  
M. Tsamparlis
11. "The Role of Laboratory Drying Curves in Practice" Eighth International Drying Symposium (IDS'92), Mondreal, Canada August 2-5, 1992  
M. Tsamparlis
12. " The Gravitational Field Equations adopted to a General Collineation" International Conference of the Greek Astronomical Society held in Athens on September 1992  
E. Saridakis and M. Tsamparlis
13. "The Generic Symmetry and its Geometrization" International Conference of the Greek Astronomical Society held in Athens on September 1992  
M. Tsamparlis
14. "The deviation equation for a general congruence in a general spacetime" 3rd International Conference of Tensor Society on Differential Geometry and its Applications, held in Athens on August 1994  
M. Tsamparlis and Th. Grammenos.
15. " Application of generic symmetry in determining the possible extensions of a homothetic Killing vector of spacial submanifold of spacetime" 3rd International Conference of Tensor Society on Differential Geometry and its Applications, held in Athens on August 1994  
M. Tsamparlis and D. Nikolopoulos.

16. “Physics Studies in Tomorrow’s Europe” European Evaluation Conference, University of Ghent, Belgium April 7-8, 1995  
M. Tsamparlis
17. “Industrialization of Agrofood Industry - The concept of Drying Station” in 11th International Drying Symposium (IDS 98), Halkidiki, Greece, August 19 -22 1998  
M. Tsamparlis
18. “Interpretations of cosmological models and geometric equations of state” 6th Hellenic Astronomical Society, Conference, 15 - 17 September 2003, Penteli, Greece.
19. “Ricci and Matter inheritance collineations of Hypersurface Orthogonal Locally Rotational Spacetimes” Second Aegean Summer School, September 2003, Syros, Greece
20. “An overview of geometrical symmetries and their role in General Relativity” NEB June 2006, Nafplion, Greece
21. “The generic model of General Relativity” NEB XIII, Thessaloniki, 2009 J. Phys.: Conf. Ser., **189**, 012041  
M. Tsamparlis
22. “Lie symmetries of the geodesic equations and projective collineations” NEB XIII, Thessaloniki, 2009 J. Phys.: Conf. Ser. **189**, 012042  
M. Tsamparlis and A. Paliathanasis
23. “Geometrization of Lie and Noether symmetries with applications in Cosmology” NEB XV, Chania 2012  
M. Tsamparlis
24. ”Lie and Noether symmetries of second order differential equations and their geometrization” 2nd congress on ”Symmetries, Differential Equations and Applications (SDEA – II)” Islamabad, Pakistan 2014 IJPM Conf Ser (2015) **38** , 156007

## Papers in International Journals

1. “Variational Methods and Torsion in General Relativity” Phys. Lett. 60A(1977), 1-2.  
J.L. Safko, M. Tsamparlis and F. Elston.
2. “On the Palatini Method of Variation Jour. Math. Phys. 19(1978), 555-557  
M. Tsamparlis
3. “Cosmological Principle and Torsion” Phys. Lett. 75A(1979), 27-28.  
M. Tsamparlis
4. “Magnetohydrodynamics in a Riemann-Cartan Space-Time” Gen. Rel. Grav. 13 (1981), 123  
D. P. Mason, M. Tsamparlis

5. "Deriving Solutions in generalised Theories of Gravitation" Phys. Rev. D. 24 (1981), 1451-1457.  
M. Tsamparlis
6. "Differential Rotation of an Electrically Conducting Fluid in General Relativity" Gen. Rel. Grav. 14 (1982), 717-725.  
M. Tsamparlis, D.P. Mason
7. "On Spacelike Congruences in General Relativity" Jour. Math. Phys. 24 (1983), 1577-1593  
M.Tsamparlis, D.P. Mason
8. "Spacelike Conformal Killing vectors and Spacelike Congruences" Jour. Math. Phys. 26(1985), 2881-2901  
D.P. Mason, M. Tsamparlis
9. "Induced Volume Forms with Applications in Relativistic Kinetic Theory" Gen. Rel. Grav. 17 (1985),831  
M. Tsamparlis
10. "Kinematic and Dynamic Properties of Killing Vectors in Anisotropic Fluids" Jour. Math. Phys. 27(1986), 2987-2994  
R. Maartens, D.P. Mason, M. Tsamparlis
11. "Ricci Collineation Vectors in Fluid Spacetimes" Jour. Math. Phys. 31 (1990), 1707  
M. Tsamparlis, D.P. Mason
12. "Symmetry Inheritance of Conformal Killing Vectors" Jour. Math. Phys. 32, (1991), 1541-1551.  
E. Saridakis, M. Tsamparlis
13. "Geometrization of a general Collineation" Jour. Math. Phys. 33, (1992) , 1472 - 1479.  
M. Tsamparlis
14. "The deviation equation for a general congruence in a general spacetime" Tensor Í.S. 56, (1995), 27 - 30  
M. Tsamparlis and Th. Grammenos.
15. " Application of generic symmetry in determining the possible extensions of a homothetic Killing vector of spatial submanifold of spacetime" Tensor N.S. 56, (1995), 31 - 36.  
M. Tsamparlis and D. Nikolopoulos.
16. "Conformal reduction of a spacetime metric" Class Quantum Grav 15 (1998) 2901 - 2908  
M. Tsamparlis



17. “ Computation of the conformal algebra of 1+3 decomposable spacetimes” Class Quantum Grav 15 (1998) 2909 - 2921  
M. Tsamparlis, D. Nikolopoulos and P. Apostolopoulos
18. “ Comment on Ricci Collineations for type B wrapped space-times” Gen Rel Grav 32 (2000) 281 - 285  
M. Tsamparlis and P. Apostolopoulos
19. “Symmetries of Bianchi I Spacetimes” Jour Math Phys (2000), 41, 7573 - 7558  
M. Tsamparlis and P. Apostolopoulos
20. “Hypersurface homogeneous locally rotational symmetric spacetimes admitting conformal symmetries” Class Quantum Grav 18, 3775 - 3790 (2001).  
P. Apostolopoulos and M. Tsamparlis
21. “Comment on Ricci Collineations for spherically symmetric space-times“ 2002 Gen. Relativ. Gravit. **34** 49-52  
P. Apostolopoulos and M. Tsamparlis
22. “Note on Matter Collineations in Kantowski-Sachs, Bianchi Types I and III Space-times“ “, 2003 Gen. Relativ. Grav. **35** 1869 - 1876  
P. Apostolopoulos and M. Tsamparlis
23. “Self-similar Bianchi type VIII and IX models“ “, 2003 Gen. Relativ. Grav. **35** 2051 - 2056  
P. Apostolopoulos and M. Tsamparlis
24. “Ricci and matter collineations of locally rotationally symmetric space-times“ , Gen. Relativ. Grav. **36** (2004)  
P. Apostolopoulos and M. Tsamparlis
25. “Geometric equations of state in Friedman - Lemaitre universes admitting matter and Ricci collineations“ , Gen. Relativ. Grav. **36** (2004)  
P. Apostolopoulos and M. Tsamparlis
26. “General Symmetries of a String Fluid space-time“ , Gen. Relativ. Grav. **38**(2006) 311 - 324  
M. Tsamparlis
27. “On the existence of CKVs for spacetime homogeneous Godel type spacetimes “ , Revista Mexicana de Fisica **52** (2006), 102- 104. Parra Y., Patino A.,Percoco U.,Tsamparlis M.
28. “Lie symmetries of geodesic equations and projective collineations “2010 Nonlinear Dynamics **62**,203 -214;  
Michael Michael Tsamparlis and Andronikos Paliathanasis
29. “Lie and Noether symmetries of geodesic equations and collineations “ , Gen. Relativ. Grav. **42**(2010), 2957 - ;  
Michael Tsamparlis and Andronikos Paliathanasis

30. “The geometric nature of Lie and Noether symmetries “ , Gen. Relativ. Grav. **43**(2011), 1861 - ;  
Michael Tsamparlis and Andronikos Paliathanasis
31. “Two-dimensional dynamical systems which admit Lie and Noether symmetries “ , J. Phys. A **44**(2011), 175202 - ;  
Michael Tsamparlis and Andronikos Paliathanasis
32. “Using the Noether symmetry approach to probe the nature of dark energy “ , Physical Review D **83**(2011), 103512 - ;  
S. Basilakos M. Tsamparlis and A. Paliathanasis
33. “Constrains and analytical solutions of f(R) theories of gravity using Noether symmetries “ , Physical Review D **84**(2011), 123514 - ;  
A. Paliathanasis M. Tsamparlis and S. Basilakos
34. “Three-fluid cosmological model using Lie and Noether symmetries “ , Class. Quantum Grav. **29**(2012), 015006 - ;  
Michael Tsamparlis and Andronikos Paliathanasis
35. “Autonomous three-dimensional Newtonian system admit Lie and Noether point symmetries “ , J. Phys. A **45**(2012), 175202 - ;  
Michael Tsamparlis and Andronikos Paliathanasis
36. “Generalizing the autonomous Kepler-Ermakov system in a Riemannian space “ , J. Phys. A **45**(2012), 275202 - ;  
Michael Tsamparlis and Andronikos Paliathanasis
37. “Lie point symmetries of a general class of PDEs: The heat equation “ , Journal of Geometry and Physics Volume **62**(2012), 2443 - ;  
Andronikos Paliathanasis and Michael Tsamparlis
38. “Conformally related metrics and Lagrangians and their physical interpretation in cosmology “ , Gen. Relativ. Gravit. **45**(2013), 2003;  
M. Tsamparlis, A. Paliathanasis, S. Basilakos and S. Capozziello
39. “Type II hidden symmetries for the homogeneous heat equation in some general classes of Riemannian spaces “ , Journal of Geometry and Physics **73**(2013), 209 ;  
Michael Tsamparlis and Andronikos Paliathanasis
40. “The reduction of the Laplace equation in certain Riemannian spaces and the resulting Type II hidden symmetries “ , Journal of Geometry and Physics **76**(2014), 107;  
Andronikos Paliathanasis and Michael Tsamparlis
41. “Noether symmetries and analytical solutions in f(T) cosmology: A complete study “ , Phys. Rev. D. **88**(2013), 103256;  
S. Basilakos, S. Capozziello, M. De Laurentis, A. Paliathanasis and M. Tsamparlis

42. “Noether The geometric origin of Lie point symmetries of the Schrodinger and the Klein Gordon equations “ , to be published in IJGMMP (2014);  
Andronikos Paliathanasis, S. Basilakos and Michael Tsamparlis
43. “New Schwarzschild-like solutions in  $f(T)$  gravity through Noether symmetries ” ,  
to be published in Phys Rev D (2014);  
Andronikos Paliathanasis S. Basilakos, E. N. Saridakis S. Capozziello, K. Atazadeh  
and Michael Tsamparlis
44. “Ricci and Matter inheritance collineations of Robertson-Walker space-times”, (*preprint*  
*gr-qc/0110042*)  
Pantelis S. Apostolopoulos and M. Tsamparlis (2001),

### **Papers on Drying**

45. “Solar Drying for Real Applications” Drying Technology 8 (1990),261- 285  
M. Tsamparlis
46. “Modeling and optimization of a tunnel grape dryer” Drying Technology 14, (1996),  
1695 - 1718  
C. Kyranoudis, Z. Maroulis, D. Marinos, M. Tsamparlis
47. “Design of Tray Dryers for Food Dehydration” Journal of Food Engineering 32  
(1997), 269 - 291  
C. Kyranoudis, Z. Maroulis, D. Marinos, M. Tsamparlis

### **Referee**

I am referee for the following journals: Journal of Mathematical Physics, General Relativity and Gravitation, The Physical Review and The Physical Review Letters, Classical and Quantum Gravity.

I also review papers for the Mathematical Reviews.

### **Citations**

- I have more than 700 citations in international journals.
- Most of my papers on General Relativity have been reviewed in Mathematical Reviews.