Vincent Daudon
Secondary school physics teacher, Paris ; France.
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Affilate Researcher at the laboratory SYstème de Référence Temps-Espace (SYRTE) - history of astronommy team- UMR 8630 - Paris Observatory - University PSL - Sorbonne University.
https://syrte.obspm.fr/spip/science/histoire/membres-de-l-equipe/article/vincent-daudon

Qualified as a Lecturer in section 72 (Epistemology, History of Science and Technology) of the National Council of Universities.

Areas of research

Concept of mathematical time

Elaboration and mathematization of the physical concepts

History and philosophy of physics in the 17th and 18th centuries

History of the astronomy from the ancients times to the classical Age.

Doctorat

« **Construction of a mathematically manipulated concept of time in natural philosophy** » — https://hal.archives-ouvertes.fr/tel-01721309

thesis defended on 15 December 2017

Abstract. By looking for the law of centripetal force registered in the *Mathematical Principles of the Natural Philosophy*, Newton gave to time a status of privileged magnitude of natural philosophy. However, this one appears in a ambiguous way, sometimes discrete magnitude, sometimes continuous magnitude. Its mathematical manipulation, which rests essentially on the *Method of first and last ratios* and on the *law of areas*, lets appear a time of geometrical nature. Confronted, in the proposal x of the book ii, with the resolution of the movement of a mobile which tests a resistance which is proportional in the square of its speed, Newton does not succeed in solving this proposal by means of the geometry. It is forced to resume its reasoning and to resort to an algebraic method in order to express in a just way the solution of this proposal, in which the time appears then under an algébraic shape, represented by a letter. So, from a geometrical time, represented by an element of space in the edition of 1687, Newton made an entity *per se* represented by a letter in proposal x of the 1713 edition. But it is to Varignon, who approached the proposals of the *Principia* by means of the differential calculus, that we owe the end of the "mathematization" and the finalization of the concept of mathematical time.

Keywords. Mathematics, natural philosophy ; Algebra, calculus, Euclidean geometry, mathematical symbol ; Concept of time, absolute time, relative time ; Concept of force ; Leibniz, Newton, Varignon ; *Principia*.

Discipline : History and philosophy of physics

Acceuil Team : Paris Diderot University (5 rue Thomas Mann 75013 Paris),
École doctorale 400 « Savoirs scientifiques, épistémologie, histoire des sciences, didactique des disciplines », Laboratory SPHERE–CNRS, UMR 7219.

Publications

Daudon, V., « Recension des *Principes Mathématiques de la Philosophie Naturelle* de Isaac Newton ; la traduction française des *Philosophiae naturalis principia mathematica* par Émilie du Châtelet ; édition critique du manuscrit par Michel Toulmonde », *Archives Internationales d'Histoire des Sciences*, vol. 67/2, n° 179, 2017.

Daudon, V., « Une étape de la mathématisation du temps en philosophie naturelle : la proposition X du livre II des *Principia* de Newton », *Archives Internationales d'Histoire des Sciences*. Accepted for publication.

Daudon, V., « La mathématisation du temps à l'Académie Royale des Sciences, les travaux de mécanique de Varignon »– under preparation

Visiting professor

2019 - 10 - 20/31 **Universidad de Valle, Cali, Colombia.**

Conferences « El tiempo matemático en la mecánica naciente »
« La enseñanza de la física en el liceo en Francia ».

Supervision of doctoral seminars in Educación y pedagógica.

Communications as guest speaker

2017 - 05 - 30 « Du temps dans les équations de la physique newtonienne », Physique et astronomie aux XVII^{e} et XVIII^{e} siècles, Paris Observatory, France.

2014 - 01 - 28 « Vers une algébrisation du temps en philosophie de la nature - une étude de la proposition X du livre II des Principia de Newton », Qu'appelle-t-on les débuts de la science classique ?, Paris Observatory, France.

Communications assessed by peer reviewers

2017 - 07 - 26 « Absolute time and the measure of time », Session : Histories of the measurement, definition and uses of time in science and technology, 25^{th} International Congress of History of Science and Technolology, Rio, Brazil.

2016 - 11 -26 « Construction d'un concept de temps mathématique en philosophie naturelle », Young Researchers Days of the French Society for the History of Science and Technology, École Nationale Supérieure, Paris, France.

2011 - 11 - 3/5 « Method of first and ultimate ratios, a personal or collective undertaking ? », Novembertaugung on History of Mathematics, Institut Henri Poincaré, Paris, France.

Teams meetings

2012 - 11 - 15 « Le concept de temps en philosophie naturelle à travers les *Principia* de Newton », Working Group of PhD Students in History and Philosophy of Physics, SPHERE Laboratory, Paris Diderot University, Paris, France.

2011 - 06 - 30 « Les mathématiques du temps dans les *Principes Mathématiques de la Philosophie Naturelle* (livre premier) de Newton », SPHERE Doctoral Students Day, SPHERE Laboratory-UMR 7219, Paris, France.

2011 - 06 - 21 « Temps et mathématiques dans les *Principes Mathématiques de la Philosophie Naturelle* (livre premier) de Newton », Inter-team Days for Doctoral Students from Lyon-Nancy-Nantes-Paris, Lyon 1 University, Lyon, France.

2010 - 06 - 30 « L'élaboration de la variable indépendante temps en philosophie naturelle aux XVII^{e} et XVIII^{e} siècles », Inter-team Days for Doctoral Students from Lyon-Nancy-Nantes-Paris, Paris Diderot University, Paris, France.

Teaching

2018	**Secondary school physics teacher**, Paris, France.
2014 – 2018	**Detached from the ministry of the National Education. Teaching of the physics to the deaf children.** National Institute of the Young Deaf persons, Paris, France.
2010 – 2012	**Lecturer** Master 1 : Epistemology and history of science for the secondary high school teachers. University Paris Diderot, Paris, France.
1997 – 2014	**Secondary school physics teacher** Paris, France.

Resume

2018 – 2020	**Associate Researcher at SPHERE laboratory (Sciences, Philosophy, History)**, UMR 7219, CNRS - Paris Diderot University (Paris 7)
2017	**PhD in history and philosophy of science** « Construction d'un concept de temps mathématiquement manipulable en philosophie naturelle »– https://hal.archives-ouvertes.fr/tel-01721309 Paris Diderot University (Paris 7) ; Laboratory SPHERE, UMR 7219, CNRS, Paris
2009	**Master history and philosophy of science** (with high honours) Master « LOgique, Philosophie, HIstoire et Sociologie des Sciences » (LOPHISS) Paris Diderot University (Paris 7) Master's thesis : « Mesures de temps ; Étude sur le passage d'un calendrier agraire à un calendrier religieux. »
2005	**Physics Certificate of Aptitude for Secondary School Teaching (CAPES) in physics and chemistry.**
1995	**Master's degree in Fundamental physics** (with honours) University Paris 7.

Academic activities

2020	Member of the Physics Teaching Reflection Group of the Paris Academy
2018	Evaluation of articles for the scientific journal with double-blind selection panel*Nacelles. Passé et présent de l'aéronautique et du spatial* http://revues.univ-tlse2.fr/pum/nacelles/index.php?id=72.
2012 - 2015	Co-organizer of the Workgroup of the PhD students in history and philosophy of the physics of the laboratory SPHERE..

Professional skills

Languages (CEFRL level)	English : B2 FSL : A2/B1 German : C1/C2 Spanish : B1
Computer	LaTeX, LyX Gimp, Inkscape, Photoshop

Personal interests

Astronomy :	Observations - lunar, solar and planetary drawings
Mountaineering :	Medium and high mountain hikes, glaciers
Music :	Practice guitar in several blues and rock bands Classical and Spanish guitare
Photography :	Réalisation black & white and color - paper and slides black and white development