Alternative Perspectives

on

**Science, Technology, Engineering, and Mathematics**

As an entrepreneur Phillips V. Bradford—BES in Electrical Engineering from The Johns Hopkins University in 1962, an MS in Electrical Engineering from the University of Virginia in 1964, and ScD in Electrical Engineering from Columbia University in 1968; former Executive Director of the Kansas Technology Enterprise Corporation from 1988 to 1989; and former Executive Director of Colorado Advanced Technology Institute from 1989 to 1999—developed a keen ability to discover and to understand alternative perspectives on science, technology, engineering, and mathematics. (Note: A synopsis of his lifetime of accomplishments, is included at the end of this document.) He shared his alternative perspectives with students in courses he taught as an adjunct faculty member at the Colorado School of Mines and with colleagues whenever the opportunity arose. To avoid cumbersome grammatical constructs, he labeled this body of knowledge in which he was deeply engrossed as simply Alternative Science. He assembled the information for his students and for all others with a bent to acquire outside the box, or alternative, perspectives on science. He created a website with a modest amount of descriptive text and a treasure trove of citations and links to the research and discoveries of ever so many others. His estate has provided a copy of this website to IEEE Region 5 for the purpose of making it available to all interested parties through the Engineering and Technology History Wiki. So, in his words:

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There are many ways to present ideas. The World Wide Web provides an opportunity for presenting some alternative ways to visualize modern ideas of various sciences and mathematics that are not usually seen in mainstream textbooks or journals.   
  
Many scientific laws are premised upon assumptions and observations that need to be revisited from time-to-time to account for new findings, or to explain new observations.   
  
It is rare that one can reveal a new observation, perform a landmark experiment, or provide an alternative or improved mathematical treatment of a certain subject that will result in an epochal change in our understanding of it. However, there are many instances of such events in the long history of science, and it is hoped that the WWW can accelerate the acceptance of such alternatives into the mainstream of knowledge as they merit such recognition.   
  
These pages are not intended to represent or advocate the views of any particular person, including myself. They may include radical, reactionary or untestable ideas about different laws of various sciences and mathematics. I hope that these pages may provide new ways of looking at such sciences, encourage "thinking outside the box", and developing new and useful technology.   
  
I believe that variations and diversity in the pedagogy for teaching twentieth century science can motivate some investigators to see things in alternative ways. Perhaps progress in the twenty-first century may come, in part, from alternative models and new heuristic approaches fueling the creative processes.   
  
The advent of the Internet allows me to present and share these alternative ways of looking at science to a worldwide community. I hope that all those who are interested will critique these ideas and help me advance them, refine them, or abandon them, as needed. I will always credit sources as accurately as I can, and hope that anyone who uses these pages in their publications will do likewise. I have no commercial interest in these ideas, and anyone may use the content of these pages for any purpose whatsoever as long as appropriate credits are given   
  
The following is my list of Alternative Sciences:

### Section 1 Personal Perspectives of Phillips V. Bradford

See [A space-time geometric interpretation of the beta factor in Special Relativity](http://anthonybradford.com/pvb/Geometric-interpretation-of-the-beta-factor-in-special-relativity.html#Geometric-interpretation-of-the-beta-factor-in-special-relativity).   
  
See [A simple algebraic method of determining the compound velocity formula in special relativity](http://anthonybradford.com/pvb/Compound-velocity-formula-in-special-relativity.html#Compound-velocity-formula-in-special-relativity).   
  
See [The physics of negative mass](http://anthonybradford.com/pvb/The-physics-of-negative-mass.html#The-physics-of-negative-mass).   
  
See [Visualizing solutions to n-th degree algebraic equations using right-angle geometric paths](http://anthonybradford.com/pvb/Lill_0027s-Method.html#Lill_0027s-Method).

### Section 2 Alternative modern physics and particle physics, including alternatives to the Standard Model (SM)

[Alternative Physics](http://www.alternativephysics.org/index.htm), An on-line book, by Bernard Burchell.   
  
[Extra Time-Like Dimensions](http://www.google.com/search?q=Cem+Salih+EXTRA+TIME-LIKE+DIMENSIONS), Master’s Thesis by Cem Salih, Oct. 2006, Ismir Institute of Technology   
  
[The Official String Theory Web Site](http://superstringtheory.com/).   
  
[The Sherwin-Rawcliff Experiment](http://redshift.vif.com/JournalFiles/V16NO4PDF/V16N4PHI.pdf), Evidence for Instant Action-at-a-Distance; by Thomas E. Phipps, Jr.   
  
[Dirac's Sea of Negative Energy (Part 1)](http://anthonybradford.com/pvb/files/HotsonPart1.pdf), and [(Part 2)](http://anthonybradford.com/pvb/files/HotsonPart2.pdf). Also listed below under Alternate energy sources.   
  
[The Structure of a Photon](http://www.google.com/search?q=The+Structure+of+the+photon+Janos+Rohan) by Janos Rohan.   
  
[The Hall Theory of Photon Structure](http://www.openseti.org/Docs/Hall_Photon_Science_Paper_B.pdf), by Charles James Hall.   
  
[Photon Structure](http://www.photonstructure.com/), by Timothy Edward Long.   
  
[NEW MODEL OF ATOMIC FORCES MAY HELP EXPLAIN PROTON STRUCTURE](http://researchnews.osu.edu/archive/gluon1.htm) from The Ohio State University Research.   
  
[Examining The Structure Of The Proton - New Technology](http://www.azonano.com/article.aspx?ArticleID=409) from the US DoE’s Jefferson Lab in Newport News VA.   
  
[Pivotal Concepts in Science](http://www.pivotalconceptsinscience.com/Pivotal_Concepts/PC_Blog_1-light.html) by William J, Blackmon

### Section 3 [Euclidean Relativity](http://www.euclideanrelativity.com/)

[Dimensions in Special Relativity - An Euclidean interpretation](http://www.euclideanrelativity.com/dimensionshtml/index.asp) by R. F. J. van Linden; Includes additional links.   
  
[Euclidean model of the spacetime - is the reality exactly as we can observe it?](http://anthonybradford.com/pvb/files/EuclideanModel.pdf), by Dr. N. Nawrot of Poland.

### Section 4 Theories of the Universe

[The Pattern of Reality](http://home.pacific.net.au/~wallacez1), by Rob Wallace. This is a well developed "theory of everything".   
  
[Gravitation, and the Unified Field Theory](http://www.johnagowan.org/) by John A. Gowan   
  
[Steinhardt and Turok at Princeton propose a cyclic theory of the Universe](http://www.spacedaily.com/news/cosmology-02c.html).   
  
[An Open Letter to the Scientific Community](http://www.cosmologystatement.org/)   
  
[Big Bang Theory Busted By 33 Top Scientists](http://rense.com/general53/bbng.htm)   
  
["Assaily"](http://editionsassailly.com/assailly_english.htm). The collected works of Jean de Climont, published as *Editions d’Assaily*, available on the Internet. The name Jean de Climont is a pseudonym for the members of the Trust Jean de Climont Associates Ltd. which maintains a large list of "dissidents" and publishes a [Monthly Dissident’s Newsletter](http://perso.numericable.fr/jeandeclimont/JdeC%20news.htm).   
  
[Alternative Physics Where Science Makes Sense](http://www.alternativephysics.org/index.htm) a free on-line book containing classical alternatives to modern physics theory by Bernard Burchell   
  
[*From Paradox to Paradigm*, book by Carel Van Der Togt of the Netherlands](http://www.paradox-paradigm.nl/).

### Section 5 Galactic formation and cosmodynamics:

[The Electric Sky](http://electric-cosmos.org/indexOLD.htm) by Donald Scott, Ph.D.   
  
[The Low Surface Brightness Universe](http://www.zebu.uoregon.edu/wales.html) From the Contentious Issues Forum, Follow-up to the Wales Conference held in Cardiff, Wales, U.K., and hosted by the [School of Physics and Astronomy at the University of Cardiff](http://www.astro.cardiff.ac.uk/).   
  
[Big Bang is Wrong](http://www.angelfire.com/az/BIGBANGisWRONG/index.html) - This page by John Kierein theorizes that the Compton Effect is the cause of the Hubble Red Shift.   
  
[Rufus’ Galaxy Web Page](http://www.google.com/search?q=The+Steady+State+Galaxy+Theory+Rufus+Young), an alternative to the Big Bang theory, by R. Rufus Young. Note: If the Rufus’ page is not available from the link shown, try "The Gravitational Instability Theory" by Rev. Daniel Izzo who has saved the text of Rufus’ page at his site at [GICT](http://www.webspawner.com/users/brdanielizzo/)   
  
Are magnetic iron needles in space the source of the Cosmic Microwave Background Radiation (CMBR)?

* [by N.C. Wickramisinge and Shigeyoshi Miono](http://adsabs.harvard.edu/full/1993Ap%26SS.209..143W), 1993.
* [Within the book *Where the Wind Blows* by Sir Fred Hoyle](http://books.google.com/books?id=e20Lza9EYHAC&pg=PA413&lpg=PA413&dq=iron+needles+in+space&source=bl&ots=w8lqgxjOLb&sig=Ef7LgevkbR1l-XwWVf2Ka6xCPrY&hl=en&sa=X&ei=xt-2T-jBPJSE8AS35oHPCg&sqi=2&ved=0CF8Q6AEwAw#v=onepage&q=iron%20needles%20in%20space&f=false).

[The Big Bang Myth](http://www.mountainman.com.au/news97_9.html), an article by Keith Stein.

### Section 6 Alternative theories of the formation of the Solar System and Geodynamics

[Snowball Solar System](http://hillscloud.wordpress.com/) by Dave Carlson.

### Section 7 Alternative theories of Gravity

[Entropic Gravity](http://en.wikipedia.org/wiki/Entropic_gravity) This topic was introduced by an article in *Science News*, Sept. 25, 2010, p. 26 "A New View of Gravity", by Tom Siegfried, and by Carl Dubois who sent an article from the Science Section of the *New York Times* Tues. July 13, 2010.   
  
[*On The Origin of Gravity and the Laws of Newton*](http://anthonybradford.com/pvb/files/1001.0785v1.pdf), Paper by Erik Verlinde, at the University of Amsterdam in the Netherlands.   
  
[*Entropic Accelerating Universe*](http://anthonybradford.com/pvb/files/1002.4278v2.pdf), D. A. Easson, P. H. Frampton, and G. F.Smoot.   
  
[Le Sage theories](http://en.wikipedia.org/wiki/LeSage_(gravity))   
  
[The Observational Impetus for Le Sage Gravity](http://www.haltonarp.com/articles/the_observational_impetus_for_le_sage_gravity), by Halton Arp.   
  
[Planetary Explosion Mechanisms](http://www.metaresearch.org/solar%20system/eph/PlanetExplosions.asp), by Tom Van Flandern at Meta Research.   
  
[Pushing Gravity: New Perspectives on Le Sage’s Theory of Gravitation](http://www.amazon.com/exec/obidos/tg/detail/-/0968368972/103-7247632-9878207?v=glance) Recent Book, as offered on Amazon.com   
  
[Physics with Aspden](http://www.aspden.org/)   
  
[EarthTech (ETI) International Inc.](http://www.earthtech.org/) Associated with the [Institute for Advanced Studies at Austin](http://www.google.com/search?q=Institute%20for%20Advanced%20Studies%20at%20Austin), directed by H. E. Puthoff, Ph. D.   
  
[Gravity Conquered?](http://www.light-science.com/gen2.html) by Jeanette Cain, concerning the research of Ning Li.   
  
Experimental Results by [Yevgeny ’Eugene’ Podklenov](http://www.youtube.com/watch?v=AgyAFElQZcU), a YouTube presentation.

### Section 8 Links on the Casimir Effect

[What is the Casimir Effect?](http://math.ucr.edu/home/baez/physics/Quantum/casimir.html)   
  
[The Force of Empty Space](http://physics.aps.org/story/v2/st28)   
  
[The Casimir effect: a force from nothing](http://physicsweb.org/articles/world/15/9/6), from physicsweb.org.   
  
[Casimir Effect](http://www.daviddarling.info/encyclopedia/C/Casimir.html), from the Enclyclopedia of Astrobiology, Astronomy, and Spaceflight.   
  
[Dipole Anti-gravity](http://tachyonics.com/), by Eue Jin Jeong, Ph.D.   
  
[Professor Fran De Aquino’s webpage](http://users.elo.com.br/~deaquino/).   
  
[Foucault Pendulum Anomalies](http://science.nasa.gov/newhome/headlines/ast06aug99_1.htm).

### Section 9 Quasars

[laserstars.org](http://laserstars.org/), see especially [Alternative Explanation for the Spectral Lines Observed in Quasars](http://laserstars.org/pdf/1975Ap&SS..37L...1V.pdf)

### Section 10 Links pertaining to new energy sources and propulsion techniques.

[Harvesting Dirac’s Sea of Negative Energy](http://www.intalek.com/) by Bill Alek   
  
[Dirac's Sea of Negative Energy (Part 1)](http://anthonybradford.com/pvb/files/HotsonPart1.pdf), and [(Part 2)](http://anthonybradford.com/pvb/files/HotsonPart2.pdf).  
  
[Antimatter Drives](http://ffden-2.phys.uaf.edu/213.web.stuff/Scott%20Kircher/antimatter.html)   
  
[Dirac Sea for Bosons](http://adsabs.harvard.edu/abs/2005PThPh.113..603N), by H. B. Neilsen & M. Ninomiya.   
  
[BlackLight Power Inc.](http://www.blacklightpower.com/) Hydrino Atoms! - Do they really exist?   
  
[Steorn](http://www.google.com/search?q=Steorn%27s+e-Orbo+self-looped+electromagnetic+motor) Is this a breakthrough in physics, or is it a hoax? See also [Steorn Free Energy](http://peswiki.com/index.php/Directory:Steorn_Free_Energy).   
  
[The Woodward effect](http://en.wikipedia.org/wiki/Woodward_effect).   
  
[Zero Point Energy - zpenergy.com index page](http://www.zpenergy.com/index.php).   
  
[The Tom Bearden Website](http://www.cheniere.org/)

### Section 11 Alternative Geophysics links

Memorial to the late Thomas Gold: [Origins of Petroleum](http://en.wikipedia.org/wiki/Thomas_Gold#Origins_of_petroleum)   
  
[Global warming controversy](http://en.wikipedia.org/wiki/Global_warming_controversy) This Wikipedia article discusses various aspects, scientific, political, and public opinions, of the global warming controversy, and has an extensive list of references. Global warming is generally regarded by many as due, in part, to mankind’s introduction of "greenhouse gases" into the Earth’s atmosphere. Alternatively, perhaps mankind’s activity is heightened by global warming due to largely natural causes. The effects of the changes in the ocean’s absorption of CO2; the counter-effects of the increase in the Earth’s albedo (reflection of sunlight from clouds); and the increased level of water vapor (also a greenhouse gas) in the air, as the Earth’s temperature rises, do not seem to be adequately considered.   
  
[The Earth’s (and other planet’s) magnetic field](http://en.wikipedia.org/wiki/Earth's_magnetic_field) is generally regarded as being driven mainly by the spin of the Earth and electric currents within the conducting magma within the Earth. An alternative, supported by studying other astronomical bodies, could be that that electrical activity driven by the Sun, lightning, and the conducting properties of the ionosphere and oceans on the surface of the spinning Earth are partly or wholly responsible for the Earth’s magnetic field. Note that the planet Venus, that rotates much more slowly than the Earth and has no oceans, has a negligible magnetic field.

### Section 12 Links pertaining to Cold Fusion.

[Kozima’s Cold Fusion Research Laboratory](http://www.geocities.jp/hjrfq930/)   
  
[Research Centre at Frascati](http://www.frascati.enea.it/nhe/index-eng.htm)   
  
[Dr. Edmund Storms](http://home.netcom.com/~storms2/) - *Taking the chill out of cold fusion*.   
  
[U.S. Navy Cold Fusion Research](http://www.lenr-canr.org/Collections/USNavy.htm).   
  
[Cold Fusion Research: Models and Benefits](http://www.padrak.com/ine/NICONF96.html), a report from the [The Institute for New Energy (INE)](http://www.padrak.com/ine/).   
  
[Cold Fusion - 18 years and heating Up](http://www.freeenergynews.com/Directory/ColdFusion/).   
  
[The Widom-Larson effect videos](http://www.youtube.com/results?search_query=The+Widom-Larson+effect&sm=3).   
  
[Andrea Rossi’s](http://www.e-catworld.com/2012/06/rossi-600c-e-cat-test-continues-for-over-30-days/) reactor blog.

### Section 13 Origins of Life

[The Origin of Life - Crystals](http://originoflife.net/crystals/index.html), Theory of A. G. Cairns-Smith.

### Section 14 Journals specializing in alternative science

[Apieron](http://redshift.vif.com/), Studies in Infinite Nature -A peer-reviewed journal of physics and astronomy.   
  
[General Science Journal](http://gsjournal.net/). A per reviewed journal specializing in alternative science.   
  
[Infinite Energy](http://www.infinite-energy.com/), a peer reviewed journal covering topics in cold fusion, new energy, renewable energy, and thermodynamics.

### Section 15 Mostly "Off the Wall" pages

[VoDou Physics](http://www.google.com/search?q=VoDou+Physics)   
  
[Ratbag Antiphysics Rag](http://www.eskimo.com/~billb/freenrg/rapr.html), Dissident Alternative Physics.   
  
[Crank Dot Net](http://www.crank.net/bigbang.html)

### Section 16 Mainstream Reference Pages

The following are links to mainstream science and mathematics reference and resource pages, useful for learning modern science and mathematics subject matter as it is usually taught in modern times. Some of these topics are rarely seen, but are not regarded as "alternative science" because they do not challenge the standard models.   
  
[The Standard Model](http://en.wikipedia.org/wiki/Standard_Model) (SM) is the currently regarded, by many, as the best attempt to understand the mathematical basis of particle physics. It is a result of more than 200 years of experimental and theoretical work that has been carefully executed for adherence to consistency of scientific principles in physics. It is not without critics, as all theories should expect. It is also not without unsolved mysteries, and it has been slow (but not completely reticent) to accept radical ideas that require revised interpretations of earlier classical results, as is acknowledged in this Wikipedia article.   
  
[Ned Wright’s Cosmology Tutorial](http://www.astro.ucla.edu/~wright/cosmolog.htm)   
  
[Earth’s Interior](http://www.seismo.unr.edu/ftp/pub/louie/class/100/interior.html) from the University of Nevada, Reno.   
  
[The Nobel e-Museum](http://www.nobel.se/index.html), includes, Biographies and Nobel Lectures of the Nobel Prize winners.   
  
[Physics Time-Line](http://www.cartage.org.lb/en/themes/Sciences/Physics/aboutphysics/physicstimeline/mainpage.htm).   
  
[Tracing the History of "Clifford Algebra"](http://www.360doc.com/content/10/0702/09/617416_36394599.shtml), Author undisclosed, but an excellent history of the subject, and a good prelude to the work of David Hestenes (below),   
  
[Geometric Algebra and Geometric Calculus](http://geocalc.clas.asu.edu/), by Prof. David Hestenes.   
  
[Claustrophobic Physics](http://exvacuo.free.fr/div/Sciences/Cours/R.Paul%20Bickerstaff%20-%20Claustrophobic%20physics.pdf), An introduction to the theory of relativity and Poincare Symmetry; by R. Paul Bickerstaff; Physics Department, University of Idaho, Moscow, ID; and Physics Department, University of Auckland, Auckland, New Zealand.   
  
[Tensors and Relativity](http://www.mth.uct.ac.za/omei/gr/) a course on the subject of General Relativity, by Peter K. S. Dunsby, at the University of Cape Town.   
  
[The Nine Planets](http://nineplanets.org/) - a Multimedia Tour of the Solar System, by Bill Arnett.   
  
[Horseshoe orbit asteroids and moons](http://en.wikipedia.org/wiki/Horseshoe_orbit)

[The negative equivalent mass of gravitational fields](http://anthonybradford.com/pvb/The-negative-equivalent-mass-of-gravitational-fields.html#The-negative-equivalent-mass-of-gravitational-fields)

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**Synopsis of the Life of Phillips V. Bradford (1940-2013)**

Phillips Verner Bradford was born June 15, 1940, in Children’s Hospital in Georgetown, Washington DC when his parents lived in Takoma Park MD. When about two years old, his family moved to Baltimore MD, where his father was employed as a Radio Engineer for defense contractors, particularly the Martin Aircraft Co.

Phillips and his family lived briefly in the Riderwood Community of Towson, MD, then in the Anneslie Community, and he attended the Stoneleigh School which was the public elementary school serving that community. His family moved to Falls Church VA in 1950 where Phillips was enrolled in the Williston Elementary School at Seven Corners from the 5th through 7th grades, and the Falls Church High School from the 8th through 10th grades. He completed his high school education by graduating from Fairfax High School in 1958, where he was honored for having a perfect attendance record. His family had moved to Fairfax VA in 1955. He was a member of the Fairfax High School Band, and was selected to perform on the piccolo for the Virginia All-State Band, which met in a summer camp at William and Mary College in 1956. He also marched with this band in Washington DC for the January 1956 Inaugural Parade for President Eisenhower as he was entering his second term. Phillips also won second prize in the county-wide science fair in his Junior Year of High School.

Phillips graduated from the Johns Hopkins University in Baltimore in 1962 with a Bachelor’s Degree in Electrical Engineering, where he also served as President of the Wilson Hall residence (named for Pres. Woodrow Wilson) in his Senior Year. He then graduated from the University of Virginia in Charlottesville VA with the Master of Electrical Engineering Degree in 1964. At the Univ. of VA, he had a perfect 4.0 grade average and was named a Newcomb Fellow. In 1968 he graduated with a doctorate in Engineering Science, Electrical Engineering, from Columbia University in New York City. The graduation ceremony, conducted by President Grayson L. Kirk was held in The Cathedral of St. John, rather than on the campus because the campus was overtaken by rebellious students protesting the War in Vietnam. His thesis was on the subject of microwave emission from electron beam generated plasma. While at Columbia University, he was awarded the distinction of membership in Sigma Xi, the honorary scientific and engineering fraternity.

Prior to graduation from Columbia, Phillips worked as Member of the Technical Staff of the Bell Telephone Laboratories in 1967. Realizing that the Bell Laboratories had begun a long-term change in its character as the result of the breakup of its parent company, AT&T Corp., and following his better interests, took the unusual step of entering into a career on Wall Street, while preserving a scientific role as a Visiting Fellow at Princeton University in its Department of Mechanical and Aerospace Engineering. On Wall Street, he served as a securities analyst for Dominick & Dominick for three years and then moved to Merrill Lynch as the first head of an analytical team for technology-based company investment analysis. During the energy crisis years, Phillips accepted an executive staff position at Ametek, Inc., where he had previously served in a significant role, identifying Ametek as a good investment value in the alternative energy field. This career step led to a period, in the late 1970s, when he developed a strong interest in the field of solar energy and helped to develop energy conserving products for Ametek and later for Phelps Dodge Industries, the manufacturing arm of one of the world’s largest copper producers. At Ametek he co-authored the *Ametek Solar Energy Handbook*, and at Phelps Dodge, he oversaw the design and production of a copper solar absorber plates and oversaw the construction of a factory for this purpose in Anaheim CA. He is the co-inventor of the process that was used for the manufacture of such plates and he became a Patent Agent, licensed to practice before the U.S. Patent and Trademark Office. In this capacity he served Phelps Dodge in other inventions, the most notable of which deals with the vitrification of waste foundry sand to prevent environmentally harmful leachates from escaping into ground water.

In 1988, he completed a manuscript with Harvey Blume which was published in 1992 by St. Martin’s Press. It was an historical work entitled *Ota Benga - The Pygmy in the Zoo* which was about an unusual incident involving his name-sake maternal grandfather, Samuel Phillips Verner.

From the early 1980s to the late 1990s, Phillips held various positions in public service. First, he served as the Director for Corporate Research at Rutgers, the State University of New Jersey, next as the Executive Director of the Kansas Advanced Technology Commission under Governor John Carlin, which Phillips converted to a quasi-public corporation, the Kansas Technology Enterprise Corp. (KTEC). This position ended when the governorship of Kansas changed hands. For a year, Phillips served as the Administrative Director of the Center for Advanced Technology in Computers and Information Systems at his alma mater, Columbia University, which was a program of the New York State Science and Technology Foundation. From 1989 to 1999 he served as the Executive Director of the Colorado Advanced Technology Institute (CATI), which is an agency of the state of Colorado. For most of the time during his public service career, Phillips was a member of the Science and Technology Council of the States and served on its Executive Committee. He served by request on the Boards of the Japan America Society of Colorado, the Colorado Medical Devices Association, and TIRE-TAP, a granting agency for the study of technologies used in recycling used motor tires.