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# CURRICULUM VITAE

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Alain HARAUX

POSITION TITLE: Emeritus Director of Research (at CNRS).

## EDUCATION/TRAINING:

| INSTITUTION AND LOCATION                                        | DEGREE<br>(if applicable) | MM/YY  | FIELD OF STUDY |
|-----------------------------------------------------------------|---------------------------|--------|----------------|
| Ecole Normale Supérieure, 45 rue d'Ulm, 75005 Paris (1969-1973) | Agregation                | 07/72. | Mathematics    |
| Université Paris 6, 4 Place Jussieu, 75005, Paris (1973-1978)   | HDR (Doctorat d'Etat)     | 06/78  | Mathematics    |

## Personal information

Nationality: French

Date of Birth: March 5, 1949.

Male/Female: Male

Personal status: Married, 2 boys (born in 1984 and 1988).

School/Institute: National Center for Scientific Research (CNRS).

Home postal address: 20, square Robinson, 92330 Sceaux, FRANCE.

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## Background

### 1) Education background:

Alain Haraux was admitted in 1969 as a student at Ecole Normale Supérieure (ENS: 45 rue d'Ulm, Paris) after two years of preparation at Lycée Saint-Louis, Paris.

### 2) Positions and Employment :

At the end of his studies at ENS, Alain Haraux applied for positions in various universities and a pure research position at CNRS. He was among the 6 students of ENS with speciality "Mathematics" to obtain the pure research position. This position

was located at the Laboratory Jacques-Louis Lions where Alain Haraux defended his habilitation and did all his career (with a few sojourns abroad as an invited professor from time to time). His final grade of Director of research was obtained in 1986.

Upon retirement in 2014, he was admitted as an “Emeritus Director of research”, a title which is attributed upon application to not more than 15% of the Directors of research. This, in addition to the status of “benevolent collaborator” allows him to pursue his research activity, and to keep essentially the same working facilities as an active research professional.

## Experience and Professional Memberships

1) Alain Haraux travelled overseas rather often during the first 2 decades of his career and delivered quite a few “seminar courses” abroad and at home, cf. the list below:

- Milan 79 (10h) Comportement a l’infini de systèmes dissipatifs
- Brown 79-80 (35h) Special topics in Differential equations
- LJLL 82 (25h) Systèmes dissipatifs non linéaires
- Taipei 82-83 (20h) Nonlinear dissipative systems
- Trento 83 (10h) Fonctions presque-périodiques et théorie des oscillations
- Trieste 84 (10h) Linear semigroups in Banach spaces
- Rio 86 (20h) Nonlinear vibrations and the wave equation
- Tokyo 86 (12h) Nonlinear vibrations and the wave equation
- LJLL 87 (25h) Introduction aux problèmes d’évolution semi-linéaires
- LJLL 88 (25h) Introduction aux problèmes d’évolution semi-linéaires
- LJLL 89 (25h) Systèmes dynamiques, processus et applications aux EDP
- LJLL 90 (25h) Systèmes dynamiques, processus et applications aux EDP
- Atlanta 92 (30h) Stability questions in PDE
- LJLL 94 (25h) Semi-groupes linéaires et applications aux EDP
- LJLL (25h) Semi-groupes linéaires et applications aux EDP
- Brasov 96 (10h) Stability questions in PDE
- Brasov 97 (10h) Stability questions in PDE
- LJLL 99 (25h) Systèmes dynamiques et applications aux EDP
- Tunis 05 (16h) Semi-groupes et problèmes d’évolution
- Como 21, (7h) The method of adapted energies, mini-course.

2) Alain Haraux has been working as a reviewer for many journals such as JDE, JFA, JMPA, JDDE, Nonlinear Analysis, Proceedings of the royal society of Edinburgh...  
More than 1000 reviews in about 45 years.

**3) Alain Haraux is an Editor-in-Chief for the following journal: Evolution equations and Control theory (EECT) <https://www.aims sciences.org/eect/editorialboard>**

He also served as an associate editor for NONRWA (Nonlinear Analysis, real world applications).

#### 4) Peer-reviewed Publications (ISI papers in blue).

1. A. Haraux; Dérivation dans les inéquations variationnelles, C.R.A.S. Paris 278, Ser. A (1974), 1257-1260.
2. A. Haraux; Développement asymptotique d'intégrales oscillantes lentement convergentes à l'infini, R.A.I.R.O. Analyse Numérique, 10, 8 (1976), 49-59.
3. A. Haraux; How to differentiate the projection on a convex set in Hilbert space. Some applications to variational inequalities, Math. Soc. Japan 29, 4 (1977), 615-631.
4. A. Haraux; Equations d'évolution non linéaires : solutions bornées et périodiques, Ann. Inst. Fourier 28, 2 (1978), 202-220.
5. H. Brezis & A. Haraux; Image d'une somme d'opérateurs monotones et applications, Israel J. Math. 23, 2 (1976), 165-186.
6. M. Figueira & A. Haraux; Théorèmes de surjectivité pour une classe d'opérateurs dans les espaces de Hilbert, Portugaliae mathematica 36, 3-4 (1977), 191-196.
7. J.B. Baillon & A. Haraux; Comportement à l'infini pour les équations d'évolution avec forcing périodique, Arch. Rat. Mech. Anal 67, 1 (1977), 101-109.
8. A. Haraux; Comportement à l'infini pour une équation des ondes non linéaire dissipative, C.R.A.S. Paris 287, Ser.A (1978), 507-509.
9. A. Haraux; Comportement à l'infini pour une équation des ondes non linéaire avec "forcing" périodique, C.R.A.S. Paris 287, Ser.A (1978), 619-621.
10. A. Haraux; Comportement à l'infini pour certains systèmes dissipatifs non linéaires, Proc. Roy. Soc. Edinburgh, 84 A (1979), 213-234.
11. M. Biroli & A. Haraux; Comportement à l'infini pour une équation des ondes non linéaire avec "forcing" presque-périodique, C.R.A.S. Paris 289, Ser.A (1979), 381-383.
12. T. Cazenave & A. Haraux; Equation de Schrödinger avec nonlinéarité logarithmique, C.R.A.S. Paris 288, Ser.A (1979), 253-256.
13. M. Biroli & A. Haraux; Asymptotic behavior for an almost periodic, strongly dissipative wave equation, J. Diff. Eq. 38 (1980), 422-440.
14. A. Haraux; Forced oscillations for some nonlinear, weakly dissipative wave equations, J. Diff. Eq. 44 (1982), 440-451.
15. T. Cazenave & A. Haraux; Equations d'évolution avec nonlinéarité logarithmique, Ann. Fac. Sci. Toulouse 2 (1980), 21-51.
16. A. Haraux & F. B. Weissler; Non-uniqueness for a semilinear initial value problem, Indiana University Math. J. 31, 2 (1982), 167-189.
17. J. P. Dias & A. Haraux; Smoothing effect and asymptotic behavior for the solutions of a nonlinear time dependent system, Proc. Roy. Soc. Edinburgh, 87A (1981), 289-303.

18. H. Cabannes & A. Haraux; Mouvements presque-périodiques d'une corde vibrante en présence d'un obstacle rectiligne, C.R.A.S. Paris 291, Ser.A (1980), 563-565.
19. A. Haraux; Behavior at infinity for dissipative systems with forcing term in Hilbert space, dans "Trends in applications of pure Mathematics to Mechanics", Vol 3 (R.J. Knops editor), Pitman Pub. Ltd. (1980), 120-125.
20. H. Cabannes & A. Haraux; Mouvements presque- périodiques d'une corde vibrante en présence d'un obstacle fixe, rectiligne ou ponctuel, Int. J. Nonlinear Mechanics 16, 5/6 (1981), 449-458.
21. H. Cabannes & A. Haraux; Almost periodic motion of a string vibrating against a straight, fixed obstacle, Nonlinear Analysis, T.M.A. 7, 2 (1983), 129-141.
22. A. Haraux; Generalized almost periodic solutions and ergodic properties of quasi-autonomous dissipative systems, J. Diff. Eq. 48 , 2 (1983), 269-279.
23. A. Haraux; Almost periodic forcing for a wave equation with a nonlinear, local damping term, Proc. Roy. Soc. Edinburgh, 94 A (1983), 195-212.
24. A. Haraux; Dissipativity in the sense of Levinson for a class of second order nonlinear evolution equations. Nonlinear Analysis, T.M.A. 6, 11 (1982), 1207-1220.
25. A. Haraux; Remarks on hamiltonian systems, Chinese J. Maths 11, 1 (1983), 5-32.
26. A. Haraux; Asymptotic behavior of trajectories for some non autonomous, almost periodic processes, J. Diff. Eq. 49, 3 (1983), 473-483.
27. A. Haraux & M. Kirane; Estimations  $C^1$  pour des problèmes paraboliques semi-linéaires, Ann. Fac. Sci. Toulouse 5 (1983), 265-280.
28. A. Haraux; Damping out of transient states for some semi-linear, quasi-autonomous systems of hyperbolic type, Rc. Accad. Naz. Sci. dei 40 (Memorie di Matematica) 101, 7, fasc.7 (1983), 89-136.
39. A. Haraux & B. Khodja; Caractère trivial de la solution de certaines équations aux dérivées partielles non linéaires dans un ouvert borné de  $\mathbb{R}^N$ , Portugaliae mathematica 42, 2 (1983-1984), 127-136.
30. A. Haraux & F. Murat; Perturbations singulières et problèmes de contrôle optimal : deux cas bien posés, C.R.A.S. Paris 297, Ser.A (1983), 21-24.
31. A. Haraux & F. Murat; Perturbations singulières et problèmes de contrôle optimal : un cas mal posé, C.R.A.S. Paris 297, Ser.A (1983), 93-96.
32. A. Haraux & F. Murat; Influence of a singular perturbation on the infimum of some functionals, J. Diff. Eq. 58 (1985), 43-75.
33. A. Haraux; On a uniqueness theorem of L. Amerio and G. Prouse, Proc. Roy. Soc. Edinburgh, 96 A (1984), 221-230.
34. A. Haraux; Stabilization of trajectories for some weakly damped hyperbolic equations, J. Diff. Eq. 59, 2 (1985), 145-154.

35. A. Haraux & A. Chabi; Une propriété de valeurs intermédiaires dans les espaces de Sobolev et applications, Ann. Fac. Sci. Toulouse 7 (1985), 87-100.
36. T. Cazenave & A. Haraux; Propriétés oscillatoires des solutions de certaines équations des ondes semi-linéaires, C.R.A.S. Paris, 298 (1984), 449-452.
37. A. Haraux; Large time behavior of the solutions to some nonlinear evolution equations, Comm. Math. Universitatis Carolinae 26, 1 (1985), 91-109.
38. T. Cazenave & A. Haraux; Oscillatory phenomena associated to semilinear wave equations in one spatial dimension, Trans. A. M. S. 300, 1 (1987), 207-233.
39. A. Haraux; Two remarks on dissipative hyperbolic problems, in "Nonlinear partial differential equations and their applications, College de France Seminar", vol. 7 (H. Brezis & J.L. Lions editors), Research Notes in Math. 122, Pitman (1984), 161-179.
40. T. Cazenave & A. Haraux; On the nature of free oscillations associated with some semilinear wave equations, dans "Nonlinear partial differential equations and their applications, College de France Seminar", vol. 7 (H. Brezis & J.L. Lions editors), Research Notes in Math. 122, Pitman (1984), 59-79.
41. A. Haraux & V. Komornik; Oscillations of anharmonic Fourier series and the wave equation. Rev. mat. ibero-americana 1, 4 (1985), 57-77.
42. A. Haraux; Propriétés d'oscillation des solutions de l'équation des ondes avec conditions de Dirichlet au bord, Séminaire Bony-Sjostrand-Meyer 1985, Exp. 9.
43. A. Haraux; Non-resonance for a strongly dissipative wave equation in higher dimensions, Manuscripta Math. 53 (1985), 145-166.
44. A. Haraux; A simple almost periodicity criterion and applications, J. Diff. Eq. 66 (1987), 51-61.
45. A. Haraux; Asymptotic behavior for two-dimensional, quasi-autonomous, almost periodic evolution equations, J. Diff. Eq. 66 (1987), 62-70.
46. A. Haraux; A new characterization of weak solutions to the damped wave equation, Funcialaj Ekvacioj 31, 3, (1988), 471-482.
47. A. Haraux; Asymptotics for some nonlinear O.D.E. of the second order, Nonlinear Analysis, T.M.A. 10, 12 (1986), 1347-1355.
48. T. Cazenave & A. Haraux; Some oscillatory properties of the wave equation in several space dimensions, J. Funct. Anal. 76, 1 (1988), 87 -109.
49. A. Haraux & A. Youkana; On a result of K. Masuda concerning reaction-diffusion equations, Tôhoku Math. J. 40, 1 (1988), 159-163.
50. A. Haraux; Sur les trajectoires compactes de systèmes dynamiques autonomes, Portugaliae Mathematica 44, 3 (1987), 253-259.
51. T. Cazenave, A.Haraux, L.Vazquez & F. B. Weissler; Nonlinear effects in the wave equation with a cubic restoring force, Computational Mechanics 5 (1989), 49-72.

52. A. Haraux; Recent results on semilinear wave equations with dissipation, Pitman Research Notes in Math. 141 (1986), 150-157.
53. A. Haraux; Linear Semi-groups in Banach spaces, Pitman Research Notes in Math. 152 (1986), 93-135.
54. A. Haraux; Asymptotics for some non linear hyperbolic equations with a one-dimensional set of rest points, Bol. Soc. Bras. Mat. 17, 2 (1986), 51-65.
55. A. Haraux & E. Zuazua; Decay estimates for some semilinear damped hyperbolic problems, Arch. Rat.Mech. Anal.100, 2 (1988), 191 – 206
56. A. Haraux & E. Zuazua; Super-solutions of eigenvalue problems and the oscillation properties of second order evolution equations, J. Diff. Eq.74, 1, (1988), 11-28.
57. A. Haraux; Attractors of asymptotically compact processes and applications to nonlinear P.D.E., Comm. in P.D.E 13, 11, (1988), 1383-1414.
58. A. Haraux; On a completion problem in the theory of distributed control of wave equations, in "Nonlinear partial differential equations and their applications, College de France Seminar 1886", (H. Brezis & J.L. Lions editors), Research Notes in Math. vol.220, Pitman (1991), 241-271.
59. A. Haraux & M. Ôtani; Quasi - periodicity of bounded solutions to some periodic evolution equations, J. Math. Soc. Japan 42, 2 (1990), 277-294
60. A. Haraux & N. Kenmochi; Asymptotic behavior of solutions to some degenerate parabolic equations, Funcialaj Ekvacioj 34, 1, (1991), 19-38.
61. A. Haraux; Contrôlabilité exacte d'une membrane rectangulaire au moyen d'une fonctionnelle analytique localisée, C.R.A.S. Paris, t.306, Série I (1988), 125 -128.
62. A. Haraux; Une remarque sur la stabilisation de certains systèmes du deuxième ordre en temps, Portugaliae Mathematica 46, 3 (1989), 246-257.
63. A. Haraux; Séries lacunaires et contrôle semi-interne des vibrations d'une plaque rectangulaire, J. Math Pures et Appl. 68 (1989), 457-465.
64. A. Haraux; A remark on the Hölder continuity of periodic solutions to some nonlinear wave equations, Nonlinear Analysis, T. M. A. 13, 5 (1989), 565-567.
65. A. Haraux; A remark on asymptotic behavior of periodic contraction processes, Houston J. Math. 16, 1990, 2, 157-162.
66. A. Haraux; Recent results on semi-linear hyperbolic problems in bounded domains, in "Partial differential equations, Proceedings, Rio de Janeiro 1986 (F. Cardoso, D.G. de Figueiredo, R. Iorio & O. Lopes Editors) Lecture Notes in Math. 1324, Springer, 118-126.
67. A. Haraux; Quelques propriétés des séries lacunaires utiles dans l'étude des vibrations élastiques, in "Nonlinear partial differential equations and their applications, College de France Seminar", vol. (H. Brezis & J.L. Lions editors), Research Notes in Math., Pitman (1988)

68. A. Haraux; A generalized internal control for the wave equation in a rectangle, *J. Math. Analysis and Appl.* 153, 1 (1990), 190-216.
69. A. Haraux; Antiperiodic solutions of some nonlinear evolution equations, *Manuscripta Math.* 63, (1989), 479-505.
70. A. Haraux; Uniform decay and Lagrange stability for linear contraction semi-groups, *Mat. Aplic. Comp.* 7, 3 (1988), 143-154.
71. A. Haraux & V. Komornik; On the vibrations of rectangular plates, *Proc. Roy. Soc. Edinburgh* 119 A (1991), 47-62.
72. A. Haraux & S. Jaffard; Pointwise and spectral control of plate vibrations, *Revista Matematica Iberoamericana* 7, 1 (1991), 1-24.
73. A. Haraux; Remarks on the wave equation with a non linear term with respect to the velocity, *Portugaliae Mathematica* 49, 4 (1992), 447-454.
74. A. Haraux; Quelques méthodes et résultats récents en théorie de la contrôlabilité exacte, *Rapport de recherche INRIA-LORRAINE* 1317 (1990).
75. T. Cazenave, A. Haraux & F. B. Weissler; Une équation des ondes complètement intégrable avec non-linéarité homogène de degré 3, *C.R.A.S. Paris* 313 (1991), 237-241.
76. T. Cazenave, A. Haraux & F. B. Weissler; A class of nonlinear completely integrable abstract wave equations, *J. Dynamics and Differential Equations* 5, 1 (1993), 129-154.
77. T. Cazenave, A. Haraux & F. B. Weissler; Detailed asymptotics for a convex hamiltonian system with two degrees of freedom, *J. Dynamics and Differential Equations* 5, 1 (1993), 155-187.
78. A. Haraux; Exponentially stable positive solutions to a forced semilinear parabolic equation, *Asymptotic Analysis* 7 (1993), 3-13.
79. A. Haraux & P. Polacik; Convergence to a positive equilibrium for some semilinear evolution equations in a ball, *Acta Math. Univ. Comenianae* LXI 2 (1993), 129-141.
80. T. Cazenave, A. Haraux & F. B. Weissler; Global behavior for some conservative nonlinear wave equations, *Mat. Contemp.* 8 (1995), 89-106.
81. A. Haraux; Some oscillatory properties of solutions to second order evolution equations, *Partial differential equations (Han-sur-Lesse, 1993)*, 159-165, *Math. Res.* 82, Akademie Verlag, Berlin (1994).
82. A. Haraux;  $L_p$  estimates of solutions to some nonlinear wave equations in one space dimension, *Int. J. Mathematical Modelling and Numerical Optimisation*, Vol. 1, (2009) nos. 1-2, 146-152.
83. A. Haraux; A remark on parabolic equations, *Portugaliae mathematica* 54, 3 (1997), 311-316.
84. A. Haraux, M. Comte & P. Mironescu) Multiplicity and stability topics in semilinear parabolic equations, *Differential and integral equations* 13 (2000), no.7-9, 801-811

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86. A. Haraux & P. Cieutat; Exponential decay and existence of almost periodic solutions for some linear forced differential equation, *Portugaliae Mathematica* 59, 2 (2002), 141-160.
87. A. Haraux & M.A. Jendoubi; Convergence of bounded weak solutions of the wave equation with linear dissipation and analytic nonlinearity, *Calc. Var. PDE.* 9 (1999), 95-124.
88. A. Haraux & Q. X. Yan; On a class of second order ODE with a typical degenerate nonlinearity, *Portugaliae mathematica* 58, 2 (2001), 233-254.
89. A. Haraux & M. Comte; The oscillation pattern of solutions to parabolic equations as time goes to infinity, *Communications in Contemporary Math.* 1, 3 (1999), 451-466.
90. A. Haraux & D. Abousaleh; A Hilbert space approach to instability in semilinear partial differential equations, *Arkiv der Matematik* 77 (2001), 187-194.
91. A. Haraux; Remarks on weak stabilization of semilinear wave equations, *ESAIM : COCV*, Vol 6 (2001), p.553-560.
92. A. Haraux; An alternative functional approach to exact controllability of conservative systems, *Portugaliae mathematica* 61, 4 (2004), 399-437.
93. A. Haraux; A hyperbolic variant of Simon's convergence theorem, in "Evolution Equations and their Applications in Physical and Life Sciences", Bad Herrenalb proceedings, Lecture Notes in Pure and Applied Mathematics 215, Marcel Dekker, New-York.Basel (2000), 255-264.
94. A. Haraux; Some sharp estimates for Parabolic equations, *Journal of Functional Analysis* 187 (2001), 110-128.
95. A. Haraux & M.A. Jendoubi ; Decay estimates to equilibrium for some evolution equations with an analytic nonlinearity, *Asymptotic Analysis* 26 (2001), 21-36.
96. A. Haraux & M.A. Jendoubi ; On the convergence of global and bounded solutions of some evolution equations, *J. Evol. Eq.* 7 (2007), 449-470.
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98. A. Haraux & P. Souplet; An example of uniformly recurrent function which is not almost periodic, *J. Fourier Anal. and Appl.*, 10, 2 (2004), 217-221.
99. A. Haraux; Positively homogeneous functions and the Łojasiewicz inequality, *Annales Polonici Mathematici* 87 (2005), 165-174.
100. A. Haraux; Decay rate of the range component of solutions to some semilinear evolution equations, *Nonlinear differential equations and applications* 13 (2006), 435-445.
101. A. Haraux & R. Chill; An optimal estimate for the difference of solutions of two abstract evolution equations, *J. Diff. Eq.* 193 (2003), 385-395.



102. A. Haraux & R. Chill; An optimal estimate for the time singular limit of an abstract wave equation, *Funkcialaj Ekvacioj* 47 (2004), 277-290.
103. A. Haraux; Slow and fast decay of solutions to some second order evolution equations, *Journal d'analyse mathématique* 95 (2005), 297-321.
104. A. Haraux , P. Martinez & J. Vancostenoble; Asymptotic stability for intermittently controlled second order evolution equations, *SIAM J. Control and Opt.* 43 (2005), 6, 2089-2108.
105. A. Haraux; Stability and multiplicity of periodic or almost periodic solutions to scalar first order ODE, *Analysis and applications* 4, 3 (2006), 1-10.
106. A. Haraux; On the double well Duffing equation with a small bounded forcing term, *Rc. Accad. Naz. Sci. dei* 40 (*Memorie di Matematica*) 122, 28, fasc.1 (2006), 24p.
107. A. Haraux; The best constant for an almost critical Sobolev imbedding, *Portugaliae Mathematica* Vol.66 (2009), Number 4, 535-541.
108. A. Haraux; Sharp estimates of bounded solutions to some second order forced equation, *J. Dynam. Diff. Eq.* 19 (2007), 4, 915-933.
109. A. Haraux; Sharp estimates of bounded solutions to a second order forced dissipative equation with structural damping, *Differential Equations & Applications* Volume 1, Number 3 (2009), 341-347.
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113. A. Haraux & H. Ôtani; Analyticity and regularity for a class of second order evolution equations, *Evol. Equ. Control Theory* 2 (2013), no. 1, 101–117
114. A. Haraux & T.S. Pham; On the Łojasiewicz exponents of quasi-homogeneous functions, *J. Singul.* 11 (2015), 52–66.
115. A. Haraux & C. Fitouri; Sharp estimates of bounded solutions to some semilinear second order dissipative equations, *J. Math Pures et Appl.* 92, 3 (2009), 313-321.
116. A. Haraux & S. Gasmi; N-cyclic functions and multiple subharmonic solutions of Duffing's equation, *J. Math Pures et Appl* 97 (2012), no. 5, 411–423.
117. A. Haraux; Sharp decay estimates of the solutions to a class of nonlinear second order ODE, *Analysis and Applications* 9 (2011), no. 1, 49-69.
118. A. Haraux; On the fast solution of evolution equations with a rapidly decaying source term, *Math. Control & Rel. Fields* 1, (March 2011) 1-20.

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120. A. Haraux & I. Ben Arbi; A sufficient condition for slow decay of a solution to a semilinear parabolic equation, *Anal. Appl. (Singap.)* 10 (2012), no. 4, 363–371.
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122. A. Haraux & I. Ben Hassen; Convergence and decay estimates for a class of second order dissipative equations involving a non-negative potential energy, *J. Funct. Anal.* 260 (2011), no. 10, 2933–2963.
123. A. Haraux & I. Ben Arbi; Slow and fast decaying solutions to a critical semilinear parabolic equation, *J. Abstr. Differ. Equ. Appl.* 4 (2013), no. 1, 1–10.
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145. A. Haraux & Mama Abdelli: The universal bound property for a class of second order ODEs. *Port. Math.* 76 (2019), no. 1, 49–56.
146. A. Haraux : A sharp stability criterion for single well Duffing and Duffing-like equations. *Nonlinear Anal.* 190 (2020), 111600, 9 pp.
147. A.Haraux, Marina Ghisi and Massimo Gobbino:  
Universal bounds for a class of second order evolution equations and applications.  
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Small perturbations for a Duffing-like evolution equation involving non-commuting operators. NoDEA Nonlinear Differential Equations Appl. 28 (2021), no. 2,
149. A.Haraux, Marina Ghisi, Chiara Gironi and Massimo Gobbino: Sharp ultimate velocity bounds for the general solution of some linear second order evolution equation with damping and bounded forcing. J. Differential Equations 305 (2021), 72–102
- 150: A. Haraux: On some damped 2 body problems. Evol. Equ. Control Theory 10 (2021), no. 3, 657–671.
- 151: A. Haraux: The method of adapted energies for second order evolution equations with dissipation, EMS Ser. Ind. Appl. Math., 3, EMS Press, Berlin, 2022, 1–58.
- 152: A. Haraux: A Newtonian approach to general black holes. Evol. Equ. Control Theory **12** (2023), no. 6, 1447–1455.
153. A. Haraux; A Possible Explanation for the Flat Curve Paradox, Lobachevskii Journal of Mathematics **45** (2024), no. 8, 3529–3537.

## 5) Books.

I. Nonlinear evolution equations : Global behavior of solutions, Lecture Notes in Math.841, Springer (1981)

II. Nonlinear vibrations and the wave equation, Textos de Metodos matematicos, UFRJ, Rio de Janeiro (1986).

New version: [SpringerBriefs in Mathematics](#), BCAM SpringerBriefs. Springer, Cham, x+102 pp. ISBN: 978-3-319-78514-1; 978-3-319-78515-8 (2018).

III. Semi-linear hyperbolic problems in bounded domains, Mathematical reports Vol 3, Part 1 (1987), J. Dieudonné Editor, Harwood Academic Publishers, Gordon & Breach.

IV. Systèmes dynamiques dissipatifs et applications, R.M.A. 17, collection dirigée par Ph. Ciarlet et J.L.Lions, Masson, Paris (1990).

V. (with T. CAZENAVE) An introduction to semilinear evolution equations, Oxford Lecture Series in Mathematics and its Applications 13 (1998).

VI. (with M.A. JENDOUBI), The convergence problem for dissipative autonomous systems. Classical methods and recent advances. SpringerBriefs in Mathematics. BCAM SpringerBriefs. Springer, Cham; BCAM Basque Center for Applied Mathematics, Bilbao, xii+142 pp. ISBN : 978-3-319-23406-9 ; 978-3-319-23407-6 (2015).

## 5) Short term projects.

155. A. Haraux & L.R. Tebou; Energy decay estimates for the wave equation with supercritical nonlinear damping, Arxiv.preprint <https://arxiv.org/abs/2204.11494>, submitted for publication.

**VII. Calculus Book (with M. GHIL & J. ROUX), Mathematics for the environment, Springer ( $\pm 600$ p, to appear in 2025).**

## **6) Summary of research track record:**

- ISI papers (*Web of Science*): 123 articles
- Total ISI citations (*Web of Science*): 2048
- Total non-self ISI citations (*Web of Science*): 1822
- ISI H-index (*Web of Science*): 21

## **7) Leadership**

### **- Research leadership:**

- Advisor of 16 PHD theses and several HDRs.

- Leader of many research Internships at the post-doctoral level, for instance A. BARABANOVA (Russia, 6 months), K.F.TIEN (Taiwan, 1y), T.H.KUO (Taiwan, 1y), Y.SHIBATA (Japan, 1y), K.HASHIMOTO (Japan, 1y), M.Q.X.YAN (China, 1y), R. CHILL (Ulm, 1Y), M.ABDELLI (Algeria, several internships, total 6 months), M. ANGUIANO (Spain, several internships, total 6 months).

- Scientific host of many visitors for periods ranging from 1 week to 6 months.

### **- Talks delivered in International Conferences outside France:**

- Behavior at infinity for dissipative systems with forcing term in Hilbert space, Edinburgh, September 1979.

- Almost periodic motion of a string vibrating against a straight, fixed obstacle, Graz, May 1981.

- Large time behavior of the solutions to some nonlinear evolution equations, Prague, May 1984.

- Recent results on semilinear wave equations with dissipation, Trieste, December 1984.

- A new characterization of weak solutions to nonlinear dissipative wave equations, Trieste, October 1985.

- Recent results on semi-linear hyperbolic problems in bounded domains Rio 8th ELAM,

July 1986.

- Oscillatory phenomena in the wave equation, Brasilia, August 1986.
- Oscillatory properties of solutions to some second order evolution equations, Hiroshima, December 1986.
- Propriétés d'oscillation des solutions d'équations hyperboliques, Blaubeuren, may 1987.
- Attractors of asymptotically compact processes and applications, Washington DC, august 1987.
- Antiperiodic solutions of some nonlinear evolution equations, Oberwolfach, june 1989.
- Some oscillatory properties of solutions to second order evolution equations, Han sur Lesse, 1993.
- Stabilizing effects of positivity in semilinear parabolic equations, Trento, june 1995.
- A hyperbolic variant of Simon's convergence theorem, Bad Herrenalb, 1998.
- Sharp estimates for Parabolic equations, Leiden, September 1999.
- An alternative functional approach to exact controllability of conservative systems, Oberwolfach, March 2000.
- Some applications of the Łojasiewicz inequality to convergence of gradient like systems, Krakow, March 2004.
- Rate of decay to equilibrium for some second order evolution problems, Gaeta, may 2004.
- Sharp estimates of bounded solutions to second order forced dissipative equations, Hammamet, March 2006.
- Sharp estimates of bounded solutions to some semilinear second order dissipative equations, Hammamet, Mars 2008.
- A list of open problems, Hammamet, March 2009.
- Slow and fast decaying solutions to some nonlinear ODE, Tokyo, October 2009.
- Slow and fast decaying solutions to some nonlinear ODE, Journées mathématiques de Kairouan n°2, November 2010.
- On a compactness problem, Moscow, Meeting for M.I. Vishik's 90th birthday, June 2012.
- Optimal decay estimates of the solutions to some second order evolution problems, ISAAC meeting, Krakow, August 2013.
- A Lyapunov function approach to stabilization of coupled hyperbolic systems, Rome,

May 2014.

- Some simple problems for the next generations, ENS. Pisa, Conference « trends in PDE », October 2016.

- The method of adapted energies for second order evolutions with dissipation, online mini-course (7 hours), Conference « PDEs of Mathematical Physics and Applications», Como, September 2021.

## **8) Side activities:**

From 2020, Alain Haraux published quite a few **preprints on theoretical physics**, some of which were ultimately published in **mathematics journals (like ref 150)** or are about to be published. In connection with his investigations in physics, but not limited to that, he created, in 2022, a YouTube channel devoted to **science popularization**, almost 100 videos in French and a few videos in English.