



## Foreword

# Ovide Arino: Friend and maestro 24th April 1947–29th September 2003

Ovide Arino<sup>1</sup> was born in Toulouse (France) on 24th April 1947. He studied mathematics at the University of Nice (France), where his professors included high-profile French mathematicians such as Dieudonné, Boutet de Monvel, and Grisvard. He graduated from Nice in 1972, and obtained his PhD in 1980 from the University of Bordeaux (France), with a thesis entitled *Contributions à l'étude des comportements des solutions d'équations différentielles à retard par des méthodes de monotonie et bifurcation*.

He joined the 'Université de Pau et des pays de l'Adour' (France) in 1973, and became a full professor there in 1988. He taught mainly differential calculus, ordinary and partial differential equations as well as dynamical systems. From 1999 he was First Class Research Director in the IRD ('Institut pour la recherche et le développement'), Paris-Bondy (France).

He held a position of Visiting Professor at the Memphis State University (Memphis, Tennessee, USA), Brigham Young University (Provo, Utah, USA) and Rice University (Houston, Texas, USA), and was tenure-tracked at the University of Mississippi (Oxford, Mississippi, USA). He also visited many universities throughout the world for various lengths of time, for collaborative work and for teaching.

Ovide was a tireless propagator of the field of biomathematics, making great effort to put students in contact with experts. His scientific reputation enabled him to bring almost anyone to a Conference or Summer School that he was organizing. During the last 10 years he led the organization of more than 20

Conferences and Summer Schools. Along with Profs. D. Axelrod and M. Kimmel, he was the instigator of the series of International Conferences on Mathematical Population Dynamics. He participated as plenary speaker, invited speaker, member of the scientific committee, member of the organizing committee and organizer of special sessions in many conferences, seminars and workshops. Between 1991 and 1996 alone, he took part in more than 40.

Not only this, but he was also responsible for connecting many people around the world who otherwise would never have met and worked together. I would like to take this occasion to thank Ovide on behalf of myself and many others for having set us on the road to our collaborations and friendships.

He was a reviewer for many leading mathematical and mathematical biology journals. He also acted as a reviewer for various mathematical indexes, for the NIH and other national scientific organizations. His involvement in the review process often led him to contact the authors directly with suggestions, most of the times refusing any acknowledgement of his contribution.

One of Ovide's characteristics was his generosity in employing his time for the benefit of his collaborators and students. He put in a lot of effort preparing and developing research projects that brought grants and funding for students to travel and stay in research centres. During the last 10 years, he obtained sponsorship and financing for research projects from international public institutions such as CNRS–CNR (France–Morocco), PICASSO (Spain–France), POLONIUM (Poland–France), IFREMER (France), MedCampus (EU), DGXIV (EU).

<sup>1</sup> A comprehensive list of Ovide Arino's works is given in the 'References' section [1–146].

But one of Ovide's foremost qualities was his involvement with students. Over the last 20 years he was able to direct more than 60 theses (PhD, 'thèses d'État', 'thèses de 3<sup>e</sup> cycle'), dedicating a great amount of his time to his students, almost to the level of guru for their future development. Many of his students originating from Morocco, Algeria, and other countries in the region, he played a key role in the development of Biomathematics in North Africa. Many of those he trained are now professors, who continued their collaboration with their former teacher, now late friend.

His privileged collaboration with Morocco has produced, among many others activities, the series of international conferences *Marrakesh International Conference on Differential Equations*, Summer Schools on delay differential equations and his naming as Scientific Coordinator of *Centre International sur les Systèmes Dynamiques* of Marrakesh.

This enormous ability for organizing and encouraging students was backed by his great scientific capacity, imagination and deep knowledge of mathematics that became known through a long list of publications, over 150, in prestigious scientific journals, inter alia *SIAM Review*, *Nonlinear Analysis T.M.A.*, *J. Diff. Equat.*, *J. Math. Biol.*, *J. Theor. Biol.*, *J. Math. Anal. Appl.*, *Math. Biosci.*

His research developed along two different and complementary lines: works with mathematical aim and modelling in population dynamics. The principal theme of his line of thought was going from model to method: after the construction of a mathematical model for the representation of a particular natural process (cell proliferation, larvae stage of fish, etc.) the necessity arises to develop and update new mathematical tools for its theoretical analysis.

His results in the field of delay differential equations stand out: oscillations, functional differential equations in infinite dimensional spaces, state-dependent delay differential equations. His interest in population dynamics developed fundamentally in two large areas: cell proliferation models and fisheries. Some of the problems dealt with from a mathematical point of view involved obtaining asymptotic properties of the solutions, in the framework of semigroup theory of positive operators as well as the application of aggregation of variables methods to models formulated with two time scales.

But not even the brilliance of his professional life can be compared with his human quality. Ovide was much more than a great scientist: he was very much a family man, extremely generous, always ready to lend a helping hand, a great conversationalist, and overall, a tolerant man: strongly seeking and supporting the goodness within each person.

Personally I would like to underline his infinite patience and affability for me at all times, his understanding. On top of all this stands the enormous help he offered me: he was the maestro I turned to, always honorable in our work and never judging me. I owe him my introduction into the field of Biomathematics, as well as allowing me to connect with others in this field. He was my best colleague and influence.

Ovide has left a significant imprint on our lives. The memory of those shared happy moments will stay forever in our hearts.

Ovide is survived by his wife Elizabeth, three sons Julien, Émilien and Lucien, one daughter Lisa and one grandson Samuel.

Rest in peace.

Eva Sánchez

*Dpto. Matemática Aplicada,  
E.T.S. Ingenieros Industriales,*

*Universidad Politécnica de Madrid, Spain*

*E-mail address: [esanchez@etsii.upm.es](mailto:esanchez@etsii.upm.es) (E. Sánchez)*

Available online 6 November 2004

## References

- [1] C. Delode, O. Arino, J.-P. Penot, Champs mesurables d'espaces polonais, *C. R. Acad. Sci. Paris, Ser. A–B* 281 (15) (1975) A617–A620.
- [2] C. Delode, O. Arino, J.-P. Penot, Champs mesurables et multi-sections, *Ann. Inst. H.-Poincaré, Sect. B (N.S.)* 12 (1) (1976) 11–42.
- [3] O. Arino, C. Delode, J. Genet, *Mesure et Intégration. Exercices et problèmes avec solutions, maîtrises de mathématiques*, Vuibert, 1976.
- [4] O. Arino, P. Séguier, Solutions périodiques d'équations différentielles à argument retardé. Oscillations autour d'un point stationnaire, conditions suffisantes de non-existence, *C. R. Acad. Sci. Paris, Ser. A–B* 284 (3) (1977) A145–A147.
- [5] O. Arino, P. Séguier, Solutions oscillantes d'équations différentielles autonomes à retard, *C. R. Acad. Sci. Paris, Ser. A–B* 287 (8) (1978) A611–A613.
- [6] O. Arino, S. Gautier, Stabilité d'un ensemble fermé pour une équation différentielle à argument retardé, *C. R. Acad. Sci. Paris, Ser. A–B* 287 (16) (1978) A1101–A1104.
- [7] O. Arino, P. Séguier, Existence of oscillating solutions for certain differential equations with delay, in: *Functional Differential Equations and Approximation of Fixed Points*, Proc. Summer School and Conf. Univ. Bonn, Bonn 1978, Springer, 1979, pp. 46–64.

- [8] O. Arino, P. Séguier, Comportement des solutions de  $x(t) + f(t, x(t)) = f(t - 1, x(t - 1))$ , C. R. Acad. Sci. Paris, Ser. A–B 288 (20) (1979) A937–A939.
- [9] O. Arino, P. Séguier, Quelques résultats de comportement des solutions d'une classe d'équations différentielles à argument retardé, in: Functional Differential Systems and Related Topics, Proc. First Int. Conf. Blazejewko, 1979, Higher College Engrg., Zielona Gora, 1980, pp. 34–48.
- [10] O. Arino, K. Khokh, Comportement des solutions d'équations différentielles à retard dans un espace ordonné, C. R. Acad. Sci. Paris, Ser. A–B 290 (21) (1980) A1009–A1011.
- [11] O. Arino, The behaviour at the infinity of the solutions of some linear equations with delay is characterized by special solutions of the adjoint equation, in: Functional-Differential Systems and Related Topics, Proc. First Int. Conf. Blazejewko, 1979, Higher College Engrg., Zielona Gora, 1980, pp. 28–33.
- [12] O. Arino, I. Gyori, Intégration asymptotique des systèmes différentiels fonctionnels asymptotiquement autonomes, C. R. Acad. Sci. Paris, Ser. I 295 (2) (1982) 87–89.
- [13] M. Kimmel, O. Arino, Complex proliferative systems. Formal description and qualitative analysis, Syst. Sci. 9 (1–2) (1983) 135–161.
- [14] O. Arino, P. Séguier, About the behaviour at infinity of solutions of  $x(t) = f(t - 1, x(t - 1)) - f(t, x(t))$ , J. Math. Anal. Appl. 96 (2) (1983) 420–436.
- [15] E. Ait-Dads, O. Arino, Asymptotic almost periodicity of the solutions of some retarded differential equations, in: Functional-Differential Systems and Related Topics, III (Blazejewko), Higher College Engrg., Zielona Gora, 1983, pp. 45–55.
- [16] O. Arino, P. Séguier, Some results on the solution's behaviour at the infinity, in: Ninth Int. Conf. on Nonlinear Oscillations, Kiev, 1981, vol. 2, Naukova Dumka, 466, Kiev, 1984, pp. 29–31.
- [17] O. Arino, F. Hanebaly, Remarque sur le théorème de Mawhin–Willem, in: Ninth Int. Conf. on Nonlinear Oscillations, Kiev, 1981, vol. 2, Naukova Dumka, 466, 1984, pp. 26–29.
- [18] O. Arino, I. Gyori, A. Jawhari, Oscillation criteria in delay equations, J. Diff. Equat. 53 (1) (1984) 115–123.
- [19] O. Arino, S. Gautier, J.-P. Penot, A fixed point theorem for sequentially continuous mappings with applications to ordinary differential equations, Funkcial. Ekvac. 27 (3) (1984) 273–279.
- [20] O. Arino, M. Kimmel, Asymptotic analysis of a functional-integral equation related to cell population kinetics, in: Trends in the Theory and Practice of Nonlinear Analysis, Arlington, Texas, 1984, North-Holland, Amsterdam, 1985, pp. 27–32.
- [21] O. Arino, T.A. Burton, J.R. Haddock, Periodic solutions to functional-differential equations, Proc. R. Soc. Edinb. Sect. A 101 (3–4) (1985) 253–271.
- [22] O. Arino, T.A. Burton, J.R. Haddock, Attractivité de la solution périodique d'une classe d'équations non linéaires du type Volterra, C. R. Acad. Sci. Paris, Ser. I 300 (15) (1985) 517–520.
- [23] O. Arino, M. Kimmel, Stability analysis of models of cell production systems, in: Mathematical Models in Medicine: Diseases and Epidemics, Part 2, Math. Model. 7 (9–12) (1986) 1269–1300.
- [24] O. Arino, Estimates for periodic solutions of differential equations, Appl. Anal. 21 (4) (1986) 307–337.
- [25] O. Arino, G. Ladas, Y.G. Sficas, On oscillations of some retarded differential equations, SIAM J. Math. Anal. 18 (1) (1987) 64–73.
- [26] O. Arino, M. Kimmel, Asymptotic analysis of a cell cycle model based on unequal division, SIAM J. Appl. Math. 47 (1) (1987) 128–145.
- [27] O. Arino, E. Haourigui, On the asymptotic behaviour of solutions of some delay differential systems which have a first integral, J. Math. Anal. Appl. 122 (1) (1987) 36–46.
- [28] O. Arino, I. Gyori, Stability results based on Gronwall type inequalities for some functional-differential systems, in: Differential Equations: Qualitative Theory, Szeged, 1984, vols. I & II, North-Holland, Amsterdam, 1987, pp. 37–59.
- [29] M. Kimmel, O. Arino, On active linear compartments, in: Mathematical modelling in science and technology, St. Louis, MO, 1987, Math. Comput. Model. 11 (1988) 1189–1194.
- [30] A. Guessab, G.V. Milovanovic, O. Arino, Extremal problems for nonnegative polynomials in  $L^r$  norm with generalized Laguerre weight, Facta Univ. Ser. Math. Inform. 3 (1988) 1–8.
- [31] A. Ben M'Barek, O. Arino, An integrability criterion for non-forced, nonlinear differential equations, Radiat. Mater. 4 (2) (1988) 261–268.
- [32] O. Arino, E. Hanebaly, Solutions presque périodiques de:  $(dx/dt) + \alpha x = h(t)$  ( $\alpha \geq 0$ ) sur les espaces Banach, C. R. Acad. Sci. Paris, Ser. I 306 (16) (1988) 707–710.
- [33] O. Arino, F. Bourad, N. Hassani, Un résultat sur le comportement asymptotique des solutions de systèmes dynamiques monotones, C. R. Acad. Sci. Paris, Ser. I 307 (7) (1988) 311–315.
- [34] O. Arino, R. Benkhalti, Periodic solutions for  $x(t) = \lambda f(x(t), x(t - 1))$ , Proc. R. Soc. Edinb., Sect. A 109 (3–4) 245–260.
- [35] O. Arino, A note on: 'On oscillation of solutions of forced functional-differential equations of second order', Math. Nachr. 122 (1985) 289–300; MR 88b: 34100] by D.C. Angelova and D.D. Bainov, Math. Nachr. 139 (1988) 303–307.
- [36] M. Kimmel, O. Arino, A system of differential equations modelling the G1 phase of the cell cycle, Comput. Math. Appl. 18 (10–11) (1989) 907–917.
- [37] O. Arino, A. Mortabit, A periodicity result for a nonlinear functional integral equation, in: Proc. Conf. on Optimization and Convex Analysis, Oxford, MS, 1989, Univ. Mississippi, 1989, pp. 1–11.
- [38] O. Arino, M. Kimmel, On some nonlinear effects in a model of population dynamics, in: Differential equations and applications, vols. I & II, Columbus, OH, 1988, Ohio Univ. Press, Athens, OH, 1989, pp. 20–25.
- [39] O. Arino, M. Kimmel, Asymptotic behaviour of a nonlinear functional-integral equation of cell kinetics with unequal division, J. Math. Biol. 27 (3) (1989) 341–354.
- [40] O. Arino, I. Gyori, Necessary and sufficient condition for oscillation of a neutral differential system with several delays, J. Diff. Equat. 81 (1) (1989) 98–105.

- [41] O. Arino, I. Gyori, Asymptotic integration of delay differential systems, *J. Math. Anal. Appl.* 138 (2) (1989) 311–327.
- [42] O. Arino, J.M. Ferreira, Total oscillatory behaviour globally in the delays, *Port. Math.* 46 (1) (1989) 71–86.
- [43] O. Arino, A. Chérif, Forced oscillations for Hamiltonian systems, in: *Differential Equations (Xanthi, 1987)*, 1989, pp. 25–32.
- [44] O. Arino, A. Chérif, An exact formula for the branch of periodic-4-solutions of  $x = -\lambda f(x(t-1))$  which bifurcates at  $\lambda = \pi/2$ , *Diff. Integr. Equat.* 2 (2) (1989) 162–169.
- [45] E. Ait Dads, O. Arino, A nonlinear delay differential equation whose solutions are asymptotically sums of periodic functions, *Funkcial. Ekvac.* 32 (1) (1989) 81–89.
- [46] O. Arino, M.L. Hbid, Periodic solutions for retarded differential systems close to ordinary ones, *Nonlinear Anal. T.M.A.* 14 (1) (1990) 23–34.
- [47] O. Arino, A. Chérif, Un système différentiel ordinaire qui fournit des solutions périodiques d'une équation à retard, *C. R. Acad. Sci. Paris, Ser. I* 311 (9) (1990) 511–514.
- [48] O. Arino, F. Bourad, On the asymptotic behaviour of the solutions of a class of scalar neutral equations generating a monotone semi-flow, *J. Diff. Equat.* 87 (1) (1990) 84–95.
- [49] O. Arino, A. Ben M'Barek, Periodic solutions of a system of differential equations of first order with discontinuous coefficients, *Facta Univ. Ser. Math. Inf.* 5 (1990) 57–66.
- [50] E. Sánchez, O. Arino, M. Kimmel, Noncompact semigroups of operators generated by cell kinetics models, *Diff. Integr. Equat.* 4 (6) (1991) 1233–1249.
- [51] M. Kimmel, O. Arino, Cell cycle kinetics with supramitotic control, two cell types, and unequal division: a model of transformed embryonic cells, *Math. Biosci.* 105 (1) (1991) 47–79.
- [52] O. Arino, K. Niri, Oscillations in vector spaces: a comparison result for monotone delay differential systems, *J. Math. Anal. Appl.* 160 (1) (1991) 267–283.
- [53] O. Arino, A. Mortabit, Slow oscillations in a model of cell population dynamics, in: *Mathematical Population Dynamics*, Marcel Dekker, 1991, pp. 13–25.
- [54] O. Arino, M. Kimmel, M. Zerner, Analysis of a cell population model with unequal division and random transition, in: *Mathematical Population Dynamics*, Marcel Dekker, 1991, pp. 3–12.
- [55] O. Arino, M. Kimmel, Asymptotic behaviour of nonlinear semigroup describing a model of selective cell growth regulation, *J. Math. Biol.* 29 (4) (1991) 283–314.
- [56] O. Arino, Monotone semi-flows which have a monotone first integral, in: *Delay differential equations and dynamical systems (Claremont, CA, 1990)*, *Lect. Notes Math.* 1475 (1991) 64–75.
- [57] O. Arino, A. Mortabit, A periodicity result for a nonlinear functional integral equation, *J. Math. Biol.* 30 (5) (1992) 437–456.
- [58] O. Arino, A. Chérif, On the existence of periodic solutions for a class of nonlinearly forced systems, *Funkcial. Ekvac.* 35 (3) (1992) 485–503.
- [59] O. Arino, R. Benkhalti, Bifurcation properties for a sequence of approximation of delay equations, *J. Math. Anal. Appl.* 171 (2) (1992) 377–388.
- [60] O. Arino, A. Ben M'Barek, Uniqueness of periodic solutions of a second-order ODE implied by jump discontinuities of the coefficients, in: *Recent trends in differential equations*, World Sci. Pub., River Edge, NJ, 1992, pp. 31–45.
- [61] O. Arino, Some spectral properties for the asymptotic behaviour of semigroups connected to population dynamics, *SIAM Rev.* 34 (3) (1992) 445–476.
- [62] A. Bouzinab, O. Arino, On the existence and uniqueness for an age-dependent population model with nonlinear growth, *Facta Univ. Ser. Math. Inf.* (8) (1993) 55–68.
- [63] O. Arino, M. Kimmel, Comparison of approaches to modeling of cell population dynamics, *SIAM J. Appl. Math.* 53 (5) (1993) 1480–1504.
- [64] O. Arino, A. Chérif, More on ordinary differential equations which yield periodic solutions of delay differential equations, *J. Math. Anal. Appl.* 180 (2) (1993) 361–385.
- [65] O. Arino, A note on the discrete Lyapunov function for scalar differential delay equations, *J. Diff. Equat.* 104 (1) (1993) 169–181.
- [66] L. Alaoui, O. Arino, Compactness and spectral properties for positive translation semigroups associated to models of population dynamics, *Diff. Integr. Equat.* 6 (2) (1993) 459–480.
- [67] M. Adimy, O. Arino, Bifurcation de Hopf globale pour des équations à retard par des semigroupes intégrés, *C. R. Acad. Sci. Paris, Ser. I* 317 (8) (1993) 767–772.
- [68] M. Kimmel, O. Arino, Two simple models of almost the same population with very different dynamics, *Math. Biosci.* 122 (2) (1994) 183–200.
- [69] O. Arino, M. Kimmel, A nondifferentiable semigroup generated by a model of cell population dynamics, *Appl. Math. Comput. Sci.* 4 (2) (1994) 211–221.
- [70] O. Arino, M.L. Hbid, Poincaré procedure for an ordinary differential system perturbed by a functional term, *Diff. Equat. Dyn. Syst.* 2 (2) (1994) 113–120.
- [71] O. Arino, M.A. El Attar, A proof of characterization of oscillation for higher-order neutral differential equations of mixed type by the Laplace transform, *Proc. R. Soc. Edinb., Sect. A* 124 (5) (1994) 909–916.
- [72] A. Boussoir, O. Arino, S. Gautier, The necessary and sufficient conditions for the integral of a multivalued map to be a polygon, *Appl. Math. Comput. Sci.* 5 (4) (1995) 657–669.
- [73] T. Benouaz, O. Arino, Determination of the stability of a nonlinear ordinary differential equation by least square approximation. Computational procedure, *Appl. Math. Comput. Sci.* 5 (1) (1995) 33–48.
- [74] O. Arino, E. Sánchez, Linear theory of abstract functional-differential equations of retarded type, *J. Math. Anal. Appl.* 191 (3) (1995) 547–571.
- [75] O. Arino, M.L. Hbid, Sur l'unicité des solutions périodiques du système différentiel à retard  $dx/dt = f(x(t-r))$ ,  $x \in \mathbf{R}$ , *Facta Univ. Ser. Math. Inf.* 10 (1995) 71–79.
- [76] O. Arino, M.A. El Attar, Necessary and sufficient condition for the oscillation of higher-order neutral differential system with several delays, *Facta Univ. Ser. Math. Inf.* 10 (1995) 81–86.
- [77] M. Kimmel, O. Arino, D.E. Axelrod, Backward/forward duality of branching processes and cell population dynamics, in:

- Differential equations and applications to biology and to industry, Claremont, CA, 1994, World Sci. Pub., River Edge, NJ, 1996, pp. 233–240.
- [78] T. Benouaz, O. Arino, Least-square approximation of a nonlinear ordinary differential equation, *Comput. Math. Appl.* 31 (8) (1996) 69–84.
- [79] O. Arino, E. Sánchez, A variation of constants formula for an abstract functional-differential equation of retarded type, *Diff. Integr. Equat.* 9 (6) (1996) 1305–1320.
- [80] O. Arino, K. Niri, Subdominant behaviour in positive semi-groups: the case of a class of delay differential equations, *Diff. Equat. Dyn. Syst.* 4 (1) (1996) 99–111.
- [81] O. Arino, K. Khokhlov, The delay effects on the behaviour of solutions of reaction diffusion equations with delay, *Appl. Anal.* 61 (3–4) (1996) 195–208.
- [82] O. Arino, M.L. Hbid, Existence of periodic solutions for a delay differential equation via the Poincaré procedure, *Diff. Equat. Dyn. Syst.* 4 (2) (1996) 125–148.
- [83] O. Arino, I. Gyori, M. Pituk, Asymptotically diagonal delay differential systems, *J. Math. Anal. Appl.* 204 (3) (1996) 701–728.
- [84] O. Arino, M. Bahaj, Periodic and almost periodic solutions of differential equations in Banach spaces, *Nonlinear Anal. T.M.A.* 26 (2) (1996) 335–341.
- [85] E. Ait Dads, K. Ezzinbi, O. Arino, Positive almost periodic solutions for some nonlinear delay integral equation, *Nonlinear Stud.* 3 (1) (1996) 85–101.
- [86] E. Ait Dads, K. Ezzinbi, O. Arino, Existence of periodic solution for some neutral nonlinear integral equation with delay time dependent, *Facta Univ. Ser. Math. Inform.* 11 (1996) 79–92.
- [87] E. Ait Dads, O. Arino, Exponential dichotomy and existence of pseudo almost-periodic solutions of some differential equations, *Nonlinear Anal. T.M.A.* 27 (4) (1996) 369–386.
- [88] K. Pakdaman, C.P. Malta, C. Grotta-Ragazzo, O. Arino, J.-F. Vibert, Transient oscillations in continuous time excitatory ring neural networks with delay, *Phys. Rev. E* 55 (3, B) (1997) 3234–3248.
- [89] O. Arino, E. Sánchez, G.F. Webb, Necessary and sufficient conditions for asynchronous exponential growth in age structured cell populations with quiescence, *J. Math. Anal. Appl.* 215 (2) (1997) 499–513.
- [90] O. Arino, E. Sánchez, G.F. Webb, Polynomial growth dynamics of telomere loss in a heterogeneous cell population, *Dynam. Contin. Discrete Impuls. Syst.* 3 (3) (1997) 263–282.
- [91] O. Arino, E. Sánchez, A survey of cell population dynamics, *J. Theor. Med.* 1 (1) (1997) 35–51.
- [92] O. Arino, R. Benkhalti, K. Ezzinbi, Existence results for initial value problems for neutral functional-differential equations, *J. Diff. Equat.* 138 (1) (1997) 188–193.
- [93] O. Arino, D. Axelrod, M. Kimmel (Eds.), *Advances in mathematical population dynamics: molecules, cells and man*, Papers from the International Conference on Mathematical Population Dynamics held at Rice Univ. Houston, TX, World Scientific Pub. Co. Inc., River Edge, NJ, May 23–27, 1997.
- [94] E. Ait Dads, K. Ezzinbi, O. Arino, Pseudo almost periodic solutions for some differential equations in a Banach space, *Nonlinear Anal. T.M.A.* 28 (7) (1997) 1141–1155.
- [95] M. Ait Babram, M.L. Hbid, O. Arino, Approximation scheme of a center manifold for functional-differential equations, *J. Math. Anal. Appl.* 213 (2) (1997) 554–572.
- [96] N. Yousfi, O. Arino, Invariant cone of slowly oscillating solution in two delays differential equations, *Acta Math. Univ. Comenian (N.S.)* 67 (2) (1998) 335–342.
- [97] T. Benouaz, O. Arino, Optimal approximation of the initial value problem, *Comput. Math. Appl.* 36 (1) (1998) 21–32.
- [98] O. Arino, W.V. Smith, Migration in age structured population dynamics, *Math. Models Methods Appl. Sci.* 8 (5) (1998) 905–925.
- [99] O. Arino, E. Sánchez, R. Bravo de la Parra, A model of an age-structured population in a multipatch environment, *Math. Comput. Model.* 27 (4) (1998) 137–150.
- [100] O. Arino, E. Sánchez, An integral equation of cell population dynamics formulated as an abstract delay equation. Some consequences, *Math. Models Methods Appl. Sci.* 8 (4) (1998) 713–735.
- [101] O. Arino, M. Pituk, Asymptotic constancy for neutral functional-differential equations, *Diff. Equat. Dyn. Syst.* 6 (3) (1998) 261–273.
- [102] O. Arino, V.R. Nosov, On stability of a class of neutral type functional-differential equations, *Math. Comput. Simul.* 45 (3–4) (1998) 299–307.
- [103] O. Arino, M.L. Hbid, R. Bravo de la Parra, A mathematical model of growth of population of fish in the larval stage: density-dependent effects, *Math. Biosci.* 150 (1) (1998) 1–20.
- [104] O. Arino, K.P. Haderl, M.L. Hbid, Existence of periodic solutions for delay differential equations with state-dependent delay, *J. Diff. Equat.* 144 (2) (1998) 263–301.
- [105] E. Ait Dads, K. Ezzinbi, O. Arino, Periodic and almost periodic results for some differential equations in Banach spaces, *Nonlinear Anal.* 31 (1–2) (1998) 163–170.
- [106] N. Yousfi, O. Arino, Slowly oscillating solutions of differential equations with delays, *Northeast Math. J.* 15 (2) (1999) 217–222.
- [107] C. Jost, O. Arino, R. Arditi, About deterministic extinction in ratio-dependent predator-prey models, *Bull. Math. Biol.* 61 (1) (1999) 19–32.
- [108] A. De Gaetano, O. Arino, Probabilistic determination of stability for a delay-differential model of the glucose-insulin dynamical system, *J. Biol. Syst.* 7 (2) (1999) 131–144.
- [109] J. Chattopadhyay, O. Arino, A predator-prey model with disease in prey, *Nonlinear Anal.* 36 (1999) 747–766.
- [110] R. Bravo de la Parra, E. Sánchez, O. Arino, P. Auger, A discrete model with density dependent fast migration, *Math. Biosci.* 157 (1–2) (1999) 91–109.
- [111] O. Arino, W.V. Smith, A nonlinear model for migrating species, *J. Math. Anal. Appl.* 229 (1) (1999) 61–87.
- [112] O. Arino, O. Sidki, An abstract neutral functional-differential equation arising from a cell population model, *J. Math. Anal. Appl.* 235 (2) (1999) 435–453.
- [113] O. Arino, E. Sánchez, R. Bravo de la Parra, P. Auger, A singular perturbation in an age-structured population model, *SIAM J. Appl. Math.* 60 (2) (1999) 408–436.
- [114] O. Arino, M. Pituk, Convergence in asymptotically autonomous functional-differential equations, *J. Math. Anal. Appl.* 237 (1) (1999) 376–392.

- [115] O. Arino, I. Gyor, Qualitative properties of the solutions of delay differential equations with impulses. I. Stability, *Diff. Equat. Dyn. Syst.* 7 (1) (1999) 21–37.
- [116] O. Arino, I. Gyor, Qualitative properties of the solutions of a delay differential equation with impulses. II. Oscillations, *Diff. Equat. Dyn. Syst.* 7 (2) (1999) 161–179.
- [117] O. Arino, Berboucha A., Estimations sur des solutions globales d'équations différentielles ordinaires, in: 2<sup>e</sup> Colloque national en analyse fonctionnelle et applications, Sidi Bel Abbès, Algeria, 1997, *Ann. Math. Univ. Sidi Bel Abbès* 6 (1999) 159–170.
- [118] P. Magal, O. Arino, Existence of periodic solutions for a state dependent delay differential equation, *J. Diff. Equat.* 165 (1) (2000) 61–95.
- [119] A. Lakmeche, O. Arino, Bifurcation of non-trivial periodic solutions of impulsive differential equations arising chemotherapeutic treatment, *Dyn. Contin. Discrete Impuls. Syst.* 7 (2) (2000) 265–287.
- [120] M. Khaladi, O. Arino, Estimation of the rate of convergence of semigroups to an asynchronous equilibrium, *Semigroup Forum* 61 (2) (2000) 209–223.
- [121] A. De Gaetano, O. Arino, Mathematical modelling of the intravenous glucose tolerance test, *J. Math. Biol.* 40 (2) (2000) 136–168.
- [122] R. Bravo de la Parra, O. Arino, E. Sánchez, P. Auger, A model for an age-structured population with two time scales, in: *Proc. Conf. on Dynamical Systems in Biology and Medicine (Veszprem, 1997)*, vol. 31, 2000, pp. 17–26.
- [123] O. Arino, J.A. Montero-Sánchez, Optimal control of a nonlinear elliptic population system, *Proc. Edinb. Math. Soc.* (2) 43 (2) (2000) 225–241.
- [124] O. Arino, K. Boushaba, A. Boussouar, A mathematical model of the dynamics of the phytoplankton–nutrient system, *Nonlinear Anal. Real World Appl.* 1 (1) (2000) 69–87.
- [125] E. Ait Dads, K. Ezzinbi, O. Arino, Periodic and almost periodic solutions for some delay integral equations in a Hilbert space, *Diff. Equat. Dyn. Syst.* 8 (3–4) (2000) 193–212.
- [126] O. Sidki, O. Arino, On semigroups of nonlinear operators and the solution of the functional differential equations, *Dyn. Contin. Discrete Impuls. Syst., Ser. A Math. Anal.* 8 (2) (2001) 249–259.
- [127] Ramzi, O. Arino, C. Koutsikopoulos, A. Boussouar, P. Lazure, Modelling and numerical simulations of larval migration of the sole (*Solea solea* (L.)) of the Bay of Biscay. Part 2: Numerical simulations, *Oceanol. Acta* 24 (2) (2001) 113–124.
- [128] Ramzi, O. Arino, C. Koutsikopoulos, A. Boussouar, P. Lazure, Modelling and numerical simulations of larval migration of the sole (*Solea solea* (L.)) of the Bay of Biscay. Part 1: Modelling, *Oceanol. Acta* 24 (2) (2001) 101–112.
- [129] O. Pardo, O. Arino, Weight-controlled recruitment of the anchovy in the late larval stage, *Nat. Resour. Model.* 14 (2) (2001) 257–286.
- [130] A. Lakmeche, O. Arino, Nonlinear mathematical model of pulsed-therapy of heterogeneous tumors, *Nonlinear Anal. Real World Appl.* 2 (4) (2001) 455–465.
- [131] T. Krisztin, O. Arino, The two-dimensional attractor of a differential equation with state-dependent delay, *J. Dyn. Diff. Equat.* 13 (3) (2001) 453–522.
- [132] M. El Massoud, O. Arino, The ideal thermocline equations, in: *Actes des VI<sup>es</sup> Journées Zaragoza–Pau de mathématiques appliquées et de statistiques*, Jaca, 1999, Publ. Univ. Pau, 2001, pp. 193–199.
- [133] A. Boussouar, S. Le Bihan, O. Arino, P. Prouzet, Mathematical model and numerical simulations of the migration and growth of Biscay Bay anchovy early larval stages, *Oceanol. Acta* 24 (5) (2001) 489–504.
- [134] Bobrowski, M. Kimmel, O. Arino, R. Chakraborty, A semigroup representation and asymptotic behavior of certain statistics of the Fisher–Wright–Moran coalescent, in: *Stochastic processes: theory and methods*, North-Holland, 2001, pp. 215–247.
- [135] O. Arino, E. Sánchez, A. Fathallah, State-dependent delay differential equations in population dynamics: modeling and analysis, in: *Topics in functional differential and difference equations* (Lisbon, 1999), *Am. Math. Soc.*, 2001, pp. 19–36.
- [136] O. Arino, M. Pituk, More on linear differential systems with small delays, *J. Diff. Equat.* 170 (2) (2001) 381–407.
- [137] M. Ait Babram, O. Arino, M.L. Hbid, Computational scheme of a center manifold for neutral functional differential equations, *J. Math. Anal. Appl.* 258 (2) (2001) 396–414.
- [138] M. Louihi, M.L. Hbid, O. Arino, Semigroup properties and the Crandall–Liggett approximation for a class of differential equations with state-dependent delays, *J. Diff. Equat.* 181 (1) (2002) 1–30.
- [139] A. El Abdallaoui, J. Chattopadhyay, O. Arino, Comparisons, by models, of some basic mechanisms acting on the dynamics of the zooplankton-toxic phytoplankton system, *Math. Models Methods Appl. Sci.* 12 (10) (2002) 1421–1451.
- [140] K. Boushaba, O. Arino, A. Boussouar, A mathematical model for phytoplankton, *Math. Models Methods Appl. Sci.* 12 (6) (2002) 871–901.
- [141] S. Portet, O. Arino, J. Vassy, D. Schoevaert, Organization of the cytokeratin network in an epithelial cell, *J. Theor. Biol.* 223 (2003) 313–333.
- [142] R. Ouifki, M.L. Hbid, O. Arino, Attractiveness and Hopf bifurcation for retarded differential equations, *Commun. Pure Appl. Anal.* 2 (2) (2003) 147–158.
- [143] M. Bachar, O. Arino, Integrated semigroup and linear ordinary differential equation with impulses, in: *Dynamical systems and their applications in biology*, Cape Breton Island, NS, 2001, *Fields Inst. Commun., Am. Math. Soc.* 36 (2003) 17–31.
- [144] M. Adioui, J.-P. Treuil, O. Arino, Alignment in a fish school: a mixed Lagrangian–Eulerian approach, *Ecol. Model.* 167 (2003) 19–32.
- [145] M. Adioui, O. Arino, W.V. Smith, J.-P. Treuil, A mathematical analysis of a fish school model, *J. Diff. Equat.* 188 (2) (2003) 406–446.
- [146] A. Mukhopadhyay, A. De Gaetano, O. Arino, Modeling the intra-venous glucose tolerance test: a global study for a single-distributed-delay model, *Discrete Contin. Dyn. Syst., Ser. B* 4 (2) (2004) 407–417.