Curriculum Vitae

CAIRO UNIVERSITY

FACULTY OF SCIENCE

Department of Mathematics

Giza, EGYPT

MOHAMED ATEF ABDEL AZIM ELSAYED HELAL
PROFESSOR OF APPLIED MATHEMATICS

Work Address:
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EDUCATION :

Ph.D. Applied Mathematics, Faculty of Science, Cairo University, Giza, EGYPT.(1982)
Doctorat 3eme Cycle, Mecanique des Fluides, IMG, Grenoble, FRANCE, (1979)
D.E.A. , Mecanique des Fluides IMG, Grenoble, FRANCE , (1976)
M.Sc. Applied Mathematics, Faculty of Science, Cairo University, Giza, EGYPT,(1975)
B.Sc. Pure and Applied Mathematics, Faculty of Science, Cairo University, Giza, EGYPT,(1969)

PERSONAL DATA :

Born in Aug. 23,1946.
Egyptian Native.
Married with Son and Daughter.
Excellent Health.

WORKING COUNTRIES:

EGYPT , FRANCE , ITALY, SUDAN AND SAUDI-ARABIA.

SKILLS :

Management Skills :

- Supervised staff group of Fluid Mechanics in EGYPT and SAUDI-ARABIA.

Research Activities :

- Electromagnetic induction in thin sheets, and its applications in oceans (M.Sc. Dissertation).
- Shallow water waves in stratified fluids (D.E.A. report).
- Fluids in rotating circular basins (3eme Cycle).
- Stratified fluids and physical oceanography (Ph.D. Dissertation).
- Non-linear P.D.Equations and soliton solutions.
- Computational Fluid Mechanics.
- Wavelets.

Teaching Activities :

Post-graduate Courses :

1. **Computational Fluid Dynamics.**
   - Chow,Chuen-Yen, "An Introduction to Computational Fluid Mechanics", McGraw-Hill Book Co.,1979.
   - John D.Anderson, Jr. , "Computational Fluid Dynamics" ,McGraw-Hill Co., 1995.

2. **Fluid Mechanics.**
   - Stoker, J.J. , " Water Waves", Interscience Publishers, Inc., New York, 1957.
   - Hirsch, C., "Numerical Computation of Internal and External Flows", Vol. I, II, John Wiley, 1988.
   - Canuto, C. et al., " Spectral Methods in Fluid Dynamics", Springer-Verlag, 1988..
   - Kundu, P.K., "Fluid Mechanics", Academic Press Inc., 1990.

Undergraduate Courses:

1. **Fluid Mechanics I.**
   - Milne-Thomson, L.M. ," Theoretical Hydrodynamics", 5th Ed., Macmillan, 1974.
   - Shames, I.H., "Mechanics of Fluids", McGraw-Hill, 3rd Ed., 1991.

- Gerthart, P.M., Gross, R.J. and Hochstein, J.I, "Fundamentals of fluid Mechanics", Addison Wesley, 1992.
- Roberso and Crowe, "Engineering Fluid Mechanics", 3rd Ed., Houghton Misslir Publisher.1992.

2. Fluid Mechanics II

- Milne-Thomson, L.M. ," Theoretical Hydrodynamics", 5th Ed., Macmillan, 1974.
- White,F.M., "Viscous Fluid Flow" ,McGraw-Hill, 1984.
- Munson, B.R., Young,D.F. and Okishi,T.H. , "Fundamentals of Fluid Mechanics", 2nd ed.,John Wiley & Sons, 1990.

3. Heat Transfer.

- Chapman, A. J., "Heat Transfer", Macmilan Pupl. Co., 1989.
- Carslaw , H.S. and Jaeger J.C., " Conduction of Heat in Solids", Oxford, 1959.]

4. Mechanics I & II

- Loney, S. L. , " Statics" , Cambridge Univ. Press, 1960.
- Loney, S. L. , "Dynamics of Particle" ,Cambridge Univ. Press, 1960.
- Ramsey, A.S., " Dynamics" , Part I & II, Cambridge Univ. Press, 1960.
- Hibbler, R.C., "Engineering Mechanics, Statics and Dynamics" , 6th Ed., Macmillan Publ. Co., 1992.

5. Computational Fluid Dynamics.

- Chow,Chuen-Yen, "An Introduction to Computational Fluid Mechanics.
- D.A. Anderson, J.C. Tannehill and R.H. Pletcher, "Computational Fluid Mechanics and Heat Transfer", ", McGraw-Hill Book Co.,1984.

6. Analytical Mechanics

- Goldstein , H., " Classical Mechanics", 2nd Ed., Addison- Wesley Publishing Co., 1980.
- Gantemacher, F., " Lectures in Analytical Mechanics" , Mir Publishers, 1970.

7. Numerical Analysis

- Burden, R.L. and Faires, J.D., " Numerical Analysis", 3rd Ed. , Prindle, Weber & Schmidt, Boston, 1985.

8. Partial Differential Equations

- Sneddon, I, " Element of Partial Differential Equations", Int. Edition, McGraw-Hill, 1985.
- Kevorkian, J. , "Partial Differential Equations , Analytical Solution Techniques", The Wadsworth & Books/Cole Advanced Books & Software, 1990.

9. Theory of Elasticity

- Muskhelishvili, N.I., " Some Basic Problems of Mathematical Theory of Elasticity" , Noordhoff Ltd., 1963.

10. Introduction to Computer Science

- Using some Arabic references

EXPERIENCE:

1969-1975	Instructor of Mathematics (Pure and Applied) at the Dept. of Maths, Fac. of Science, Cairo University.
1975-1982	Researcher at the "Institute de Mecanique de Grenoble" , FRANCE.
1982-1983	Lecturer of Applied Maths. At Cairo University, Fac. of Science.
1983	Post-Doctoral Research Fellow, ICTP, Trieste, ITALY.
1983-1984	Lecturer of Applied Maths. At Cairo University (Khartom Branch), Fac. of Science, SUDAN.
1984 - 1985	Lecturer of Applied Maths. At Cairo University, Fac. of Science.
1985-1990	Assistant Professor of Applied Maths. College of education for girls, Riyadh , SAUDI-ARABIA.
1990-1991	Associate Professor of Applied Maths. College of education for girls, Riyadh , SAUDI-ARABIA.
1991-2000	Associate Professor of Applied Maths. At Cairo University, Fac. of Science.
2001-	Professor of Applied Maths. At Cairo University, Fac. of Science.

UNIVERSITY SERVICE :

- Member, Department of Mathematics Committee, Cairo University.
- Member, Graduate Study Committee, Faculty of Science, Cairo University.
- Member, Faculty of Science Committee, Cairo University.
- One of the supervisors, Computer Laboratory, Faculty of Science, Cairo University.
- Member, Committee of Club of Computer, Faculty of Science, Cairo University
- One of the supervisors of the seminars of Applied Mathematics , Faculty of Science, Cairo University.

SOCIETIES MEMBERSHIP :

- American Mathematical Society (AMS), member.
- London Mathematical Society (LMS) , member.
- Society of Industerial and Applied Mathematics (SIAM), member.

- Inistitute of Mathematics and its Applications (IMA), **Fellow (FIMA**), Chartered Mathematician.
- Royal Astronomical Society (RAS**), Fellow (FRAS).**
- Egyptian Physical and Mathematical Society (EPMS), member.
- Egyptian Computer Society , member.
- Egyptian Mathematical Society (EMS**), Board of Directors**..
- Marquis Who's Who in Science and Engineering, 2nd Ed., 1994-1995, 3rd Ed. 1995-1996.
- Marquis Who's Who in the World, from 14th Ed.,1997 untill now 19th Ed. 2002.

Other Important Scientific Activities

- Associate editor (Journal : Chaos, Solitons and Fractals) , section Turbulent Flow and Solitons.
- Referee for several International and National scientific Journals.
- Member in the National Committee of Theoretical and Applied Mechanics, Egyptian Academy of Scientific research, Cairo. EGYPT

REFERENCES:

1. Prof. A.A. Ashour, (D. Sc.), Mubarak Prize of Basic Scieces(EGYPT)
   Dept. of Mathematics, Faculty of Science , Cairo University., Giza, EGYPT. (Supervisor M.Sc. thesis).

2. Prof. J.P. Germain
   Institute de Mecanique de Grenoble, Universite de Grenoble, FRANCE. (Supervisor Ph.D. thesis).

3. Prof. A. Osman
   Head, Dept. of Physics, Faculty of Science , Cairo University, Giza, EGYPT.

4. Prof. M. Asaad (D.Sc.)
   Dept. of Mathematics, Faculty of Science , Cairo University, Giza, EGYPT .

5. Prof. A.F. Bacha.
   Ex. Vice-President of Cairo University, Giza, EGYPT.

HONORS AND AWARDS:

1- First Class Honors in Mathematics 1969.
2- Prize of Musharafa in Mathematics 1969.

SUPERVISED M.Sc. and Ph.D. THESES :

1. Non-Linear Waves in Shallow Water.
   (M.Sc. Thesis of Mrs. Hussa Nasser Al- Eissa, 1989).

2. Study of Non-Linear Problems with Some Applications in Shallow Water.
   (M.Sc. Thesis of Mr. Omar Hamed El-Kalaawy, 1994).

3. Non-Linear Wave propagation in Fluids.
   .(M.Sc. Thesis of Miss. Mona Samir Mehanna, 2001).

4. Wavelet and its applications in Applied Mathematics
   (Ph.D. Thesis of Mrs. Nahla Al-Haggar under preparation).

5. Magnetohydrodynamic stability for axisymmetric incompressible ideal flows.
   (Ph.D. Thesis of Mr. Ali El- Seadawy under preparation).

6. On Soliton wave solution
   .(Ph.D. Thesis of Miss. Mona Samir Mehanna, under preparation).

LIST OF PUBLICATIONS :

THESES :

- M.Sc. Thesis :
  Electromagnetic induction in thin sheets, Dept. of Mathematics, Fac. of Science, Cairo University , Giza, EGYPT, 1975.

- Doctorat du 3eme Cycle. Thesis **:**
  Application de la theorie de l'eau profonde au cas des fluides en bicouches et des fluides en milieu tournant. IMG , USMG, Grenoble, FRANCE , 1979.

- Ph.D. Thesis:
  Application de la theorie de l'eau profonde au cas des fluides en bicouches et des fluides en milieu tournant. Dept. of Mathematics, Fac. of Science, Cairo University , Giza , EGYPT, 1982.

TECHNICAL PAPERS :

1. M. A. Helal & J. M. Molines, "Non-linear internal waves in shallow water. A theoretical and experimental study" , Tellus , 33, pp. 488-504 (1981).

2. M. A. Helal, " A nonlinear model for the harmonic wave oscillations around a circular island", Proc. 6thMiami Int. Conf. On Alternative Energy Sources, Vol. 3, pp. 213-218, December 12-14 (1983).

3. M. A. Helal & S. Badawi, " Waves in a rotating stratified shallow water", Il Nuovo Cimento (B) , 104, 3, pp. 245-262 (1989).

4. M. S. Abou-Dina & M. A. Helal, " The influence of a submerged obstacle on an incident wave in stratified shallow water", Eur. J. Mech. B/Fluids, 9, 6, pp. 545-564 (1990).

5. M. S. Abou-Dina & M. A. Helal, " The effect of a fixed barrier on an incident progressive wave in shallow water", Il Nuovo Cimento (B) , 107, 3, pp. 331-344 (1992).

6. M. S. Abou-Dina & M. A. Helal, "The effect of a fixed submerged obstacle on an incident wave in stratified shallow water. (Mathematical Aspects)" ,Il Nuovo Cimento (B), 110, 8, pp. 927-942 (1995).

7. M. A. Helal & H. N. El- Eissa , "Shallow water waves and KdV equation (Oceanographical applications)", PU.M.A. , 7, 3-4, pp. 263-282 (1996).

8. E. H. Doha & M. A. Helal, "An accurate double Chebyshev spectral approximation for parabolic partial differential equations", J. Egypt. Math. Soc. , 5, 1, pp. 83- 101(1997).

9. A.H. Khater , O. H. El-Kalaawy & M. A. Helal, "Two new classes of exact solutions for the KdV equation via Backlund transformations", Chaos, Solitons and Fractals ; 8, pp 1901-1909 (1997).

10. A.H. Khater , M. A. Helal & O. H. El-Kalaawy, "Backlund transformations: exact solutions for the KdV and the Calogero - Degasperis-Fokas mKdV equations", Mathematical methods in Applied Sciences, 21, pp. 719-731 (1998).

11. M. S. Abou-Dina & M. A. Helal, "Reduction for the nonlinear problem of fluid waves to a system of integro-differential equations with an oceanographical application", J. Computational and Applied Mathematics , 95, pp. 65-81 (1998).

12. M. S. Abou-Dina & M. A. Helal, "Boundary integral method applied to the transient, nonlinear wave propagation in a fluid with initial free surface elevation", Applied Mathematical Modelling, 24, pp. 535-549 (2000).

13. M. A. Helal, "Shallow water waves in a rotating rectangular basin", Int. J. Math. & Math. Sci. , 24 , 10 , pp. 649-661 (2000).

14. A.H. Khater , M. A. Helal & A. R. Seadawy, " General soliton solutions of an n-dimensional nonlinear Schrodinger equations", Il Nuovo Cimento (B), 115, 11, pp. 1303-1311 (2000).

15. M. A. Helal, "A Chebyshev spectral method for solving KdV equation with hydrodynamical application", Chaos, Solitons and Fractals , 12, pp. 943-950 (2001).

16. A.H. Khater , M. A. Helal & A. R. Seadawy, " Nonlinear magnetohydrodynamic stability for axisymmetric incompressible ideal flows", J. Plasma Physics (2002).

17. M. A. Helal, " Soliton solution of some nonlinear partial differential equations and its applications in fluid mechanics", Chaos, Solitons and Fractals , 13, pp. 1917-1929, (2002).

18. M. A. Helal, " Soliton and compacton solutions for some nonlinear partial differential equations", Proceding of the Int. Conf. of The Egyptian Mathematical Society, Cairo-EGYPT, 28-31 December (2002).

19- A. M. Wazwaz and M.A. Helal , "Variants of the generalized fifth-order KdV equation with compact and noncompact structures", *Chaos, Solitons & Fractals* , 21, pp. 579–589 , (2004).

20 – A. M. Wazwaz and M.A. Helal , “Nonlinear variants of the BBM equation with compact and noncompact physical structures ”, Chaos, Solitons and Fractals , 26 , pp. 767-776, (2005).

21- M. A. Helal and M. S. Mehanna , “A Comparison Between two Different methods for Solving KdV- Burgers Equation” , 8th Conference on Theoretical and Applied Mechanics, Ministry of State for Scientific Research, Academy of Scientific Research Technology, Cairo, April 5-7, (2005).