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SMR/92 - 2

AUTUMN COURSE

ON

VARIATIONAL METHODS IN ANALYSIS AND MATHEMATICAL PHYSICS

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REFERENCES FOR THE COURSE ON MORSE THEORY

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These are preliminary lecture notes, intended only for distribution to participants.
Missing or extra copies are available from Room 230.

Some references for the course on Morse theory

Henri BERESTYCKI

1. On Morse theory (and applications)

- J. MILNOR, Morse theory, Annals Math. Study, vol. 51, Princeton Univ. Press (Princeton, 1953).
- J. T. SCHWARTZ, Nonlinear functional analysis, Gordon & Breach Science Pub. (New York, 1969).
- Section 4 in the paper of R. BOTT, "Marston Morse and his mathematical works", Bull. A.M.S. vol. 3, n°3, (1980) pp. 907-950.
[This paper also contains historical remarks on the subject and a large bibliography].
- M. MORSE & S.S. CAIRNS, Critical point theory in global analysis and differential topology, Academic Press (New York, 1969).
- R. PALAIS, "Morse theory on Hilbert manifolds", Topology 2, (1963), pp. 299-340.
- R. PALAIS & J. SMALE, "A generalized Morse theory", Bull. A.M.S. 70, (1964), pp. 165-172.

2. On geometric applications of Morse theory

- J. MILNOR (reference above)
- J. T. SCHWARTZ (" ")
- M. MORSE, Calculus of Variations in the large, A.M.S. Colloqu. Pub. n° 18, AMS, (Providence, 1934).

- M. MORSE, Global variational analysis: Weierstrass integrals on a Riemannian manifold, Math. Notes, Princeton Univ. Press (Princeton, 1976).
- W. KLINGENBERG, Lectures on closed geodesics, Springer Verlag (New York). Grundlehren der Mathematischen Wissenschaften.
- SEIFERT - THRELFAH, Variationsrechnung im grossen, Teubner (Leipzig, 1938).

3. Introduction to differentiable manifolds

- S. LANG, Introduction to differentiable manifolds, Interscience, (New York, 1962).
- J. MILNOR, Topology from the differentiable viewpoint, Univ. of Virginia Press (Charlottesville, 1966).
- J. R. MUNKRES, Elementary differential topology, Annals of Math. Study, 54, Princeton Univ. Press, (Princeton, 1963).
- D. KAHN, Introduction to global analysis, Academic Press, (New York, 1980).
- M. HIRSCH, Differential topology, Springer Verlag, (New York, 1976).
- A. H. WALLACE, Differential topology

One may also consult the other textbooks - or books - in this section of the library (section 515...).

4) Algebraic topology

- A. DOLD, Lectures on algebraic topology, Springer Verlag (New York); Grundlehren vol. 200.
- A. H. WALLACE, Algebraic topology, Benjamin, (New York, 1970)
- A. H. WALLACE, Introduction to algebraic topology, Pergamon Press (N.Y., 1957).
- R. M. SWITZER, Algebraic topology - Homotopy and Homology theory, Springer Verlag (N.Y.), Grundlehren, vol. 212.
- S. T. HU, Homotopy theory, Academic Press (N.Y., 1959)
- S. T. HU, Homology theory, Holden Day (San Francisco, 1966)
- M. ZISMANN, Topologie algébrique élémentaire, Armand Colin, Coll. U, (Paris).
- C. GODBILLON, Éléments de topologie algébrique, Hermann (Paris).
- P. J. HILTON, Introduction to Homotopy theory, Cambridge Univ. Press (Cambridge, 1953).
- P. J. HILTON & S. WYLIE, Homology theory, Cambridge Univ. Press (Cambridge, 1960).
- MASSEY, Algebraic topology: an introduction, Springer Verlag (N.Y.); Graduate Texts in Math. vol. 56.

* One may also consult the other textbooks - or books - in this section of the library (Sections SIS.14 etc.).

5. On variational methods in the study of problems

- L. NIENBERG, "Variational and topological methods in nonlinear problems", Bull. A.M.S. vol. 4, n° 3, (1981), pp. 261 - 302.
- L. NIRENBERG, Topics in nonlinear functional analysis, Lecture Notes in Math., Courant Institute, N.Y.U. New York (1974).
- A. AMBROSETTI & P. H. RABINOWITZ, "Dual variational methods in critical point theory and applications." J. Functional Analysis 14 (1973), pp. 349 - 381.
- P. H. RABINOWITZ, "Variational methods for nonlinear eigenvalue problems", in CIME, Eigenvalues of nonlinear problems, (Varenna 1974), (Conati & Prodi editors), Ediz. Cremonese, (Rome, 1974), pp. 141 - 195.
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- P. H. RABINOWITZ, "Periodic solutions of Hamiltonian systems: a survey". To appear.
- H. BERESTYCKI & C. STUART, "Iterative methods for solving nonlinear eigenvalue problems". To appear.

6. SOME selected applications of Morse theory to nonlinear problems

- H. AMANN & E. ZEHNDER, "Nontrivial solutions for a class of non-resonance problems and applications". Annali Mat. Pura Applic.

- K.C. CHANG, "Solutions of asymptotically linear operator equations via Morse theory". *Comm. Pure Appl. Math.*
- S. STALE, "Morse theory and a nonlinear generalization of the Dirichlet problem". *Annals Math.* 80 (1964), pp. 382-396.
- A. MARINO & G. PRODI, "La teoria di Morse per gli spazi di Hilbert: Un'applicazione al problema della derivazione per operatori variazionali". *Rend. Sem. Mat. Univ. Padova* 41 (1968) pp. 43-68.
- A. MARINO & G. PRODI, "Metodi perturbativi nella teoria di Morse", *Boll. Unione Mat. Italiana* (4), 11, (1975), pp. 1-32.
- A. BAHRI & H. BERESTYCKI, "Existence de solutions périodiques pour des systèmes Hamiltoniens en présence d'un terme d'excitation". *Comptes-Rendus Acad. Sc. Paris* 1981.
- A. BAHRI & H. BERESTYCKI, "Forced vibrations of superquadratic Hamiltonian systems". To appear.
- A. BAHRI & H. BERESTYCKI, "Periodic solutions of some nonlinear systems of differential equations".
- A. BAHRI, Thèse de Doctorat d'Etat, Univ. P. et M. Curie, 1981 (Paris).
- A. BAHRI, "Une méthode perturbative en théorie de Morse", à paraître.