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Received A.B. degree in physics with highest honors from Princeton
    University 9/74; awarded the Shuichi Kusaka Memorial Prize in
    Physics and admitted to Sigma Xi and Phi Beta Kappa.

Enrolled in the Ph.D. program in physics at the University of California
    at Berkeley 9/74 - 9/78. Received degree 12/78. Awarded the
    Bernard Friedman Memorial Prize in Mathematics 6/78. Thesis
    title: " Gauge Invariant Perturbation Theory in Spatially Homogeneous
    Cosmology."
        Supported by: Du Pont Graduate Fellowship   9/74 - 8/76
                       Research Assistantship with A.H. Taub   9/77 - 6/78
                       Summer Research Assistantship with J.E. Marsden 6/78 - 9/78

Postdoctoral Research Associate with J.W. York, Jr. at the University of
    North Carolina at Chapel Hill   9/78 - 8/79 .
NATO Postdoctoral Fellow at the University of Rome [Italy] with
    Remo Ruffini   9/79 - 8/80 .
Visiting Researcher at the Max-Planck-Institut für Astrophysik
    in München with J. Ehlers   10/80 - 6/81 .

Invited speaker at the International School of Relativistic Astrophysics,
    Erice, Sicily, fall 1975.
Participant in the Battelle Gravitational Radiation Conference, July 1978.
Invited speaker at the Berkeley Symposium on Relativity and Cosmology:
    In Honor of Abraham H. Taub, August 1978.
Invited speaker at the Marcel Grossmann Meeting, July 1979.
Participant in GR-8, GR-9.

BACKGROUND

I was introduced to relativity as an undergraduate at Princeton where Remo Ruffini helped initiate my interest in the application of the techniques of modern differential geometry and Lie group theory to physics. This interest has largely been focused on one of the largest intersections of relativity and Lie group theory, namely spatially homogeneous cosmology, where proper recognition of the roles played by various symmetry groups has enabled me to develop a rather simple and unified understanding of a subject that has been plagued by careless errors, neglect of symmetry and fragmented results. I received my Ph.D. in physics from U.C. Berkeley where I did my doctoral thesis under Abraham Taub, investigating the application to cosmology of Moncrief's development of gauge invariant perturbation theory from the Hamiltonian point of view.

Then I received a NATO postdoctoral fellowship which I delayed so that I could spend a year with Jim York. There I clarified the role of conformal methods in cosmology and the relevance of the York-Smarr prescription for the "slicing and threading" of these spacetimes to the dynamics of the evolution problem. A study of the consequences of the compatibility of the contraints and evolution equations led to certain solution generating techniques relating vacuum and stiff perfect fluid spatially homogeneous spacetimes and the conformally related spatially self-similar spacetimes, as well as a uniform derivation of all of the known exact solutions of this class of spacetimes together with some new solutions. During my second year of postdoctoral research, spent at the University of Rome with the NATO fellowship, I considered the "failure of variational principles" for symmetric cosmological spacetimes from a new, simple and rather instructive point of view, and began considering applications of the Belinsky-Zakharov soliton solution generating technique in the nonstationary case. I also updated and refined my manuscript "Spatially Homogeneous Cosmology: Background and Dynamics" (completed in '1977) for a book being edited by my NATO scientific advisor Remo Ruffini. In view of the increasing interest in cosmological solutions of the Einstein-Dirac system in which the gravitational field is generated by a classical Dirac spinor field, I extended my approach to this case, yielding an elegant example of a completely canonical

derivatively coupled system in which the number of degrees of freedom may be reduced to the minimum number by explicitly solving the constraints. Currently I am a visiting researcher at the Max-Planck-Institut where I am studying certain exact nonstationary spacetimes generated by the Belinsky-Zakharov technique.

REFERENCES

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Richard O. Hansen, 22240 Center St. #11, Castro Valley, Ca. 94546

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[2] "Tensor Harmonics on the 3-sphere," J. Math. Phys. 19, 1163-1172 (1978).

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"Generalized Einstein-Yang Mills Field Theories, unpublished work with A.E. Fischer, 1978-1979.

"Unified Einstein-Gauge Field Theory (The Geometry of a Principal Fiber Bundle Over a Curved Spacetime)", unpublished seminar notes at U.C. Berkeley, 1977.

"A Pedestrian's Guide to the Mathematics of Spatially Homogeneous Cosmology", unpublished undergraduate thesis at Princeton University, 1974.

Unpublished (1972) translation to English of two papers by Luigi Bianchi:

(i) "Sugli spazi a tre dimensioni che ammettono un gruppo continuo di movimenti", Collected Works of Bianchi, vol. 9, pp. 17-109.

(ii) pp. 550-557 of "Lezioni sulla teoria dei gruppi continui di trasformazioni" (1918) dealing with the classification of 3-dimensional Lie algebras.