COSMOS AND ITS FURNITURE I

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Abstract. In this talk I shall continue the study of the geometry of the moduli-space of pairs of points in 3 dimensions. I show that this space, $\underline{\tilde{H}}$, is the base space of a canonical family of associative k -algebras in dimension 4. The study of the corresponding family of derivations leads to a natural way of introducing an action of the gauge Lie algebras of the Standard Model, in $\underline{\tilde{H}}$. The results fit well with the set-up of the Standard Model. It also furnishes a possible mathematical model for a Big Bang-scenario in cosmology. These subjects are all treated within the set-up of [**?**].

Contents

References

[1] St. Augustin *Les Confessions de Saint Augustin* par Paul Janet. Charpentier, Libraire-Éditeur, Paris (1861).

[2] Harald Bjar and O. A. Laudal (1990) *Deformations of Lie algebras, and Lie algebras of Deformations* Comp. Math.75:69-111,1990. .

[3] E.Eriksen, O.A.Laudal, A.Siqveland Noncommutative Deformation Theory Book in preparation.

[4] Brian Greene The Fabric of the Cosmos, Allen Lane 2004

[5] Kitty Ferguson (2010) *Pythagoras. His lives and the legacy of a rational universe* Icon Books Ltd.

[6] O. Gravir Imenes (2011) *The concept of charge in a model based on non-commutative algebraic geometry.* Dissertation presented for the degree of Philosophiae Doctor. Faculty of Mathematics and Natural Sciences, University of Oslo, September 2011.

[7] Stephen Hawking (1988) *A Brief History of Time.* Bantam Books, Transworld Publishers, London. (1988)

[8] O. A. Laudal (1979) *Formal moduli of algebraic structures* Lecture Notes in Math.754, Springer Verlag, (1979).

[9] O. A. Laudal (1986) *Matric Massey products and formal moduli I* in (Roos, J.E.ed.) Algebra, Algebraic Topology and their interactions Lecture Notes in Mathematics, Springer Verlag, vol 1183, (1986) pp. 218–240.

[10] O. A. Laudal (2002) *Noncommutative deformations of modules* Special Issue in Honor of Jan-Erik Roos, Homology, Homotopy, and Applications, Ed. Hvedri Inassaridze. International Press, (2002).See also: Homology, Homotopy, Appl. 4(2002), pp. 357-396,

[11] O. A. Laudal (2000) *Noncommutative Algebraic Geometry* Max-Planck-Institut für Mathematik, Bonn, 2000 (115).

[12] O. A. Laudal (2001) *Noncommutative algebraic geometry* Proceedings of the International Conference in honor of Prof. Jos Luis Vicente Cordoba, Sevilla 2001. Revista Matematica Iberoamericana.19 (2003), 1-72.

[13] O. A. Laudal (2003) *The structure of $Simp_n(A)$* (Preprint, Institut Mittag-Leffler, 2003-04.) Proceedings of NATO Advanced Research Workshop, Computational Commutative and Non-Commutative Algebraic Geometry. Chisinau, Moldova, June 2004.

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[14] O. A. Laudal (2005) *Time-space and Space-times* Conference on Noncommutative Geometry and Representatioon Theory in Mathematical Physics. Karlstad, 5-10 July 2004. Ed. Jürgen Fuchs, et al. American Mathematical Society, Contemporary Mathematics, Vol. 391, 2005. ISSN: 0271-4132.
[15] O. A. Laudal (2007) *Phase Spaces and Deformation Theory* Preprint, Institut Mittag-Leffler, 2006-07. See also the part of the paper published in: Acta Applicanda Mathematicae, 25 January 2008.
[16] O. A. Laudal (2007) *Geometry of Time Spaces* World Scientific, (2011).
[17] O. A. Laudal (2007) *Cosmos and its Furniture* Proceedings Rabat/Lahore 2013..
[18] O. A. Laudal and G. Pfister (1988) *Local moduli and singularities* Lecture Notes in Mathematics, Springer Verlag, vol. 1310, (1988)
[19] J.Madore, S. Schraml, P. Schupp, J. Wess (2000) *Gauge Theory on Noncommutative Spaces* arXiv:hep-th/0001203v1 28 Jan 2000.
[20] F.Mandl and G. Shaw (1984) *Quantum field theory* A Wiley-Interscience publication. John Wiley and Sons Ltd. (1984)
[21] R. Penrose *What came before the Big Bang? Cycles of Time*Vintage Books (2011)
[22] C. Procesi (1967) *Non-commutative affine rings* Atti Accad. Naz. Lincei Rend.Cl. Sci. Fis. Mat. Natur. (8)(1967), 239-255
[23] C. Procesi (1973): Rings with polynomial identities. Marcel Dekker, Inc. New York, (1973).
[24] R.K.Sachs and H.Wu (1977) *General Relativity for Mathematicians* Springer Verlag, (1977)
[25] T. Schücker (2002) *Forces from Connes' geometry* arXiv:hep-th/0111236v2, 7 June 2002.
[26] N. Seiberg and E.Witten (1999) *String Theory and Noncommutative Geometry* JHEP 9909,032(1999),hep-th/9908142.
[27] S. Weinberg (1995) *The Quantum Theory of Fields. Vol I, II, III* Cambridge University Press, (1995).

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