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AVERTISSEMENT

Ce volume contient les textes d'un certain nombre de conférences des Journées de Metz "Analyse sur les variétés" organisées les 28, 29 et 30 Mai 1979 par le Département de Mathématiques de l'Université de Metz.

Je remercie vivement la Société Mathématique de France, le C.N.R.S. et l'Université de Metz pour l'aide financière et matérielle apportée lors de la tenue de ces Journées et pour la publication des textes de ces conférences.

A. ROUX

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S. GALLOT - Variétés dont le spectre ressemble à celui d'une sphère.	33
<i>On a riemannian manifold, A. Lichnerowicz proved that the first eigenvalue λ_1 of the Laplace-operator Δ is a greater than $n.k_0$, when $(n-1)k_0$ is the smallest eigenvalue of the Ricci-curvature. Chapter 2 gives more precise estimates on the spectrum of Δ. Chapters 1 et 4 contain a new proof of a theorem of M. Obata : the equality $\lambda_1 = n.k_0$ is characteristic of the canonical sphere (S^n, can). We generalize this theorem into a characterization of (S^n, can) by the existence (for some p) of a solution of (E_p), where (E_p) is the equation which characterizes the p-th eigenspace of Δ on (S^n, can). In chapter 3, by making a variation on these equations, we show that, if λ_1 is not too far from $n.k_0$, then the manifold is homeomorphic to S^n.</i>	
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<i>La formule de Pizzetti exprime la valeur moyenne d'une fonction intégrable sur une sphère comme une fonction de Bessel de la racine carrée du laplacien. On donne plus généralement une expres-</i>	

sion analogue pour la valeur moyenne d'une fonction sur une sphère géodésique d'une variété riemannienne. Ceci permet de donner une caractérisation des variétés d'Einstein.

- T. AUBIN - Un théorème de Fredholm non linéaire pour la transformation conforme de la courbure scalaire. 57

We shall deal with the following problem on the sphere : find a conformal metric, for which the scalar curvature would be a given function "close" to the constant function 1. The differential equation $\Delta(\varphi) = f$ associated with this problem is non-linear, elliptic and locally noninvertible.

It is solved here in dimension 2 and we obtain a theorem like that of Fredholm. There exist a vector space E of finite dimension and a function $h(f) \in E$, such that equation $\Delta(\varphi) = f - h(f)$ has a C^∞ solution φ satisfying some natural orthogonality conditions with E .

- E. COMBET - Exposé sur les singularités des distributions de Fourier à symboles homogènes. 63

We indicate some geometrical aspects of singularities of Fourier distributions $A = \int e^{i\varphi(x,\phi)} a(x,\phi) d\phi$ with a normal phase φ and homogeneous symbol a .

- N. DESOLNEUX-MOULIS - Famille à un paramètre de feuilletages proches d'une fibration. 77

We consider a one parameter family $\{\mathcal{F}_t\}_{t \in [0,1]}$ of foliations of a compact manifold and we assume the following : $\mathcal{F}_0$ is a fibration with basis B and fiber F , the Euler-Poincaré characteristic of B is non zero and $\pi_1(F)$ is commutative. Then, under an additional transversality condition on the family, we prove that, for t small enough, the foliation $\mathcal{F}_t$ has a compact leave.

- A. LICHNEROWICZ - Les algèbres formelles associées à une variété symplectique et leurs automorphismes. 85

We associate to a symplectic manifold (W, F) the trivial associative algebra defined on the space $N = C^\infty(W; \mathbb{R})$ by the usual product of the functions and the Lie algebra defined on N by the Poisson bracket $\{ , \}$. We study the deformations of these two algebras in the sense of Gerstenhaber. Such deformations give a new interpretation of the usual Quantum Mechanics. It is in particular the case for the star-products; a star-product is an associative deformation of (N, N) :

$$u *_v v = uv + v\{u, v\} + \sum_{h=2}^{\infty} v^h C_h(u, v)$$

such that $1 *_v u = u *_v 1 = u \quad u *_v v = v *_v u$.

The study of these star-products induces interesting cohomological problems and results. The group of automorphisms of a star-product is strictly connected with the group of the symplectomorphism of the manifold.