НЯКОИ ПО-СЪЩЕСТВЕНИ И ПОКАЗАТЕЛНИ ЦИТИРАНИЯ

НА НАУЧНИТЕ ТРУДОВЕ

НА

ПРОФ. ДФН СТОЙЧО ЯЗАДЖИЕВ

1. **Geoffrey Compere, Sophie de Buyl, Ella Jamsin and Amitabh Virmani, Class. Quantum Grav. 26 (2009) 125016**

"An exact solution describing such a ring configuration is not known in the literature. It is likely that the exact ring solution could be obtained by applying the Yazadjiev solution-generating technique [59, 60] to the Pomeransky–Sen'kov solution [15]. However, to the best of our knowledge, such a construction has not yet been attempted. The Yazadjiev technique requires reducing the five-dimensional theory to two dimensions; and therefore, in the case of five-dimensional supergravity, it would require us to work with the affine extension of the *G*2 Lie algebra ".

2. **D. FAJMAN, W. SIMON, Adv. Theor. Math. Phys. 18, 687-707 (2014)**

"**Abstract.** We prove area inequalities for stable marginally outer trapped surfaces in Einstein-Maxwell-dilaton theory. Our inspiration comes on the one hand from a corresponding recent upper bound for the area in terms of the charges obtained by Dain, Jaramillo and Reiris [1] in the pure Einstein-Maxwell case without symmetries, and on the other hand from Yazadjiev's inequality [2] in the axially symmetric Einstein-Maxwell-dilaton case. The common issue in these proofs and in the present one is a functional W of the matter fields for which the stability condition readily yields an upper bound. On the other hand, the step which crucially depends on whether or not a dilaton field is present is to obtain a lower bound for W as well. We obtain the latter by first setting up a variational principle for W with respect to the dilaton field _, then by proving existence of a minimizer as solution of the corresponding Euler-Lagrange equations and finally by estimating W ( ). In the special case that the normal components of the electric and magnetic fields are proportional we obtain the area bound A ≥ 8_PQ in terms of the electric and magnetic charges. In the generic case our results are less explicit but imply rigorous 'perturbation' results for the above inequality. All our inequalities are saturated for a 2-parameter family of static, extreme solutions found by Gibbons [3]. Via the Bekenstein-Hawking relation A = 4S our results give positive lower bounds for the entropy S which are particularly interesting in the Einstein-Maxwell-dilaton case."

"This bound is saturated for the extreme Gibbons solutions (but not for extreme Reissner-Nordstr¨om), and consistent with Yazadjiev's inequality (1.7)." "In this setting, Yazadiev's result [2] provides in particular the information that the simultaneous presence of both charges Q and P guarantees A > 0 for sufficiently small angular momentum…"

3. **Piotr T. Chrusciel, J. Lopes Costa, Markus Heusler,** ***Living Rev. Relativity 15, (2012), 7***

"…Moreover, the interiors are in fact diffeomorphic. To establish this last fundamental result it is necessary to exclude the existence of exceptional orbits of the toroidal action; this was done by Hollands and Yazadjiev in [169] by extending the results in [260] to the KK-black hole setting. In particular one obtains the following decomposition <<Mext>> \ (∪A_i) ≈ R × T^(n−2) × R × R+ , where ∪Ai is the union of all axes; we note that such product structure is necessary to the construction of Weyl coordinates [75, 64] and, consequently, indispensable to perform the desired reduction of the vacuum equations. As already discussed, basic properties of black rings show that a classification of KK-black holes in terms of mass, angular momenta and horizon topology is not possible. But, as argued by Hollands and Yazadjiev [169], the angular momenta and the structure of the orbit space characterize such black holes if one further assumes non-degeneracy of the event horizon. This orbit space structureis in turn determined by the interval structure of the boundary of the quotient manifold…"
"The proof of Theorem 4.1 can be outlined as follows: After establishing the, mainly topological, results of Sections 4.3, 4.4 and 4.5, the proof follows closely the arguments for uniqueness of 4-dimensional stationary and axisymmetric electrovacuum black holes. First, a generalized Mazur identity is valid in higher dimensions (see [218, 31] and Section 7.1). From this Hollands and Yazadjiev show that…."

4. **Yu Chen, Edward Teo, Nucl. Phys. B838: 207-237, 2010**

"…By defining a more mathematical version of the rod structure (known as the interval structure) that takes into account the global properties of the space-time, Hollands and Yazadjiev [9, 10] proved certain uniqueness theorems for stationary black holes which are either asymptotically R^(D−1,1), or asymptotically R^(s,1) ×T^(D−s−1) where 0 < s < D−1…"

"…When restricted to the case when there is no black hole, Hollands and Yazadjiev's theorems [9, 10] immediately imply the following result: For gravitational instantons with U(1) × U(1) isometry, asymptotically approaching the Euclidean space E4, or the product space E3×S1 (with S1 finite), there exists at most one gravitational instanton for a given rod structure…"

5. **Shinya Tomizawa_ and Hideki Ishihara, Prog.Theor.Phys.Suppl. 189 (2011) 7-51**

"…Considering the rod structure helps us understand the properties of the solutions such as the global structure or the horizon topology, in particular, it was shown by Hollands and Yazadjiev (22) that under symmetry assumptions R × U(1) × U(1), a five-dimensional asymptotically flat black hole spacetime is uniquely determined by the asymptotic conserved charges and rod structure [See Ref. 22) for the precise statement.]…"

" The topology theorems (23)–(25) yield that in five-dimensions, cross-sections of the event horizon must be topologically either a sphere, a ring, and a lens-space or their connected sums. Hollands and Yazadjiev (22) showed under symmetry assumptions R×U(1)×U(1), the horizon topology is restricted to either a sphere, a ring, or a lensspace.”

6. **Daisuke Ida, Akihiro Ishibashib and Tetsuya Shiromizu**, **Prog.Theor.Phys.Suppl. 189 (2011) 52-92**

“The above uniqueness result for spherical black holes has been extended to more general cases that include other horizon topologies by Hollands and Yazadjiev (39) by employing the interval structure as a set of parameters to completely determine a black hole solution. We quote their theorem:

Theorem 5.2: [Reference 39)] *Consider in* 5*-dimensions, two stationary, asymptotically flat, vacuum black hole spacetimes with non-degenerate horizon, having two commuting axial Killing fields that commute also with the stationary Killing field. Assume that the both solutions have the same interval structure and the same values of the angular momenta. Then they are isometric. “*

7. **Norman Metzner, Twistor Theory of Higher-Dimensional Black Holes, *Doctor of Philosophy in Mathematics, Thesis,* Mathematical Institute, St John’s College University of Oxford**

“Since mass and angular momenta are not enough anymore to classify the solutions, an extra piece of information is needed. This extra piece was proposed to be the so-called rod structure [11, 21, 24] and Hollands & Yazadjiev [24] were able to show that two stationary, axisymmetric and asymptotically flat black hole solutions with connected horizon must be isometric, if their mass, angular momenta and rod structures coincide. “

“Examples for five dimensions are given in Hollands & Yazadjiev [24]. They have topologically different horizons so there cannot exist a continuous parameter to link them. A useful tool for the study of solutions in five dimensions is the so-called rod structure”.

“In order to assign a rod structure to a given space-time we quote the following proposition.
Proposition 6.6 (Proposition 3 in Hollands & Yazadjiev [24]). *Let* (*M*, *gab*) *be the exterior of a stationary, asymptotically flat, analytic, five-dimensional vacuum black hole space-time with connected horizon and isometry group G* = U(1)2 × R. *Then the orbit space ˆM = M/G is a simply connected 2-manifold with boundaries and corners. If A˜ denotes the matrix of inner products of the spatial (periodic) Killing vectors then furthermore, in the interior, on the one-dimensional boundary segments (except the segment corresponding to the horizon), and at the corners A˜has rank 2, 1 or 0, respectively. “*

“Second, consider the rods which do not correspond to the horizon (assuming that H is connected). Proposition 1 and the argument leading to Proposition 3 in Hollands & Yazadjiev [24] show that on those rods the rotational Killing vectors are linearly dependent and the rank of *J* again drops precisely by one. Whence, on each rod (*ai*, *ai*+1) that is not the horizon, there is a vanishing linear combination *aX*1 +*bX*2. Therefore the vector □ 0 *a b* _t spans the ker *J*(0,

x), $x \in (a_i, a_{i+1})$. By Hollands & Yazadjiev [24, Prop. 1] a and b are constant so that we take aX_1+bX_2 as the rod vector on (a_i, a_{i+1})."

"Using this extended set of parameters the following theorem is a first step towards a classification.
Theorem 10.3 (Hollands & Yazadjiev [24]). *Two five-dimensional, asymptotically flat vacuum space-times with connected horizon where each of the space-times admits three commuting Killing vector fields, one time translation and two axial Killing vector fields, are isometric if they have the same mass and two angular momenta, and their rod structures coincide."*

8. **Yu Chen and Edward Teo, Phys. Rev. D 78, 064062 (2008)**

"Hollands and Yazadjiev [7,8] have recently considered how a uniqueness result might be proved for black holes in five dimensions. They showed that stationary, asymptotically flat vacuum black holes with two commuting axial symmetries are uniquely determined by their mass, angular momentum…"

"Supposing that such a black-lens solution exists, Hollands and Yazadjiev [7] showed that the simplest rod structure it could take is the one depicted in Fig. 1. In this figure, t is the time coordinate, while and … are the two axial coordinates. "

9. **PAUL TOD, NORMAN METZNER, AND LIONEL MASON, Class.Quant.Grav. 30 (2013) 095002**

"This rod corresponds to an event horizon with topology S^3 (see (Hollands & Yazadjiev 2008), proof of Proposition 2 in Section 3)".

Thus, $(-c\kappa^2, c\kappa^2)$ is a finite timelike rod and it can be shown that it corresponds to an event horizon with topology $S^2 \times S^1$ (a brief reasoning can be found in (Hollands & Yazadjiev 2008), proof of Proposition 2 in Section 3).

"Using this extended set of parameters the following theorem from (Hollands & Yazadjiev 2008) is a first step towards a classification.

Theorem 3.2. *Two five-dimensional, asymptotically flat vacuum space- times with connected horizon where each of the space-times admits three commuting Killing vector fields, one time translation and two axial Killing vector fields, are isometric if they have the same mass and two angular momenta, and their rod structures coincide."*

"Can we construct a Lens space-time this way, that is a space-time whose horizon is connected and has the topology of a Lens space (Hollands & Yazadjiev 2008, Prop. 2)?"

10. **Tim-Torben Paetz and Walter Simon**, **Class.Quant.Grav. 30 (2013) 235005**

“ A further motivation comes from the area inequalities for stable MOTS [22, 23]. Such inequalities have been found in particular for axially symmetric, stable 2d MOTS in 4d Einstein-Maxwell by Gabach-Clement, Jaramillo and Reiris [24, 25] and in 4d Einstein-Maxwell dilaton (EMD) theory by Yazadjiev [26].”

“In EMD theory, for couplings which include Einstein-Maxwell (i.e. no dilaton) and the Lagrangian (6), Yazadjiev [26] has shown that for stable 2d MOTS A ≥ 8_p |J2 − Q2P2|.”

“Here we restrict ourselves to relate the limiting cases of the inequalities found by Hollands and Yazadjiev mentioned above.”

11. **Burkhard Kleihaus, Jutta Kunz and Kirsten Schnulle, Phys.Lett. B699 (2011) 192-198**

“Concerning electrically charged black rings, static solutions have been discovered by Ida and Uchida [11] in Einstein-Maxwell theory, while Kunduri and Lucietti [12] and Yazadjiev [13] have derived static solutions in Einstein-Maxwell dilaton theory.”

“In the limit of $H = 0$, we observe excellent agreement with the analytical solution by Yazadjiev [13], with a maximum deviation of order 10−5 only. “

“Concerning the numerical accuracy, excellent agreement with the static analytical solution by Yazadjiev [13] and the neutral analytical solution by Emparan and Reall [7] has been found, with an accuracy of at least 10−5 and 10−4, respectively.”

12. **M. Cvetic, G.W. Gibbons and C.N. Pope**, **Class.Quant.Grav. 28 (2011) 195001**

“The solutions for a black hole immersed in a magnetic field in Einstein-Maxwell-Dilaton theory have been given by Yazadjiev [32]. He gives results in higher dimensions also, but here we quote the result just for D = 4. The main change is that F in (2.14) is replaced by F 11+_2 where α is the dilaton coupling constant. The area, surface gravity and mass of the solution are independent of α, as is the location of the horizon. The horizon metric is …”

“As mentioned above, applying a magnetic field to a rotating or charged black hole produces quite complicated results owing to various induction effects. However, if the magnetic field lies as along a direction (i.e. a two-plane direction) about which the black hole is not rotating, then Yazadjiev [32] has shown that even in Einstein-Maxwell dilaton theory the metric remains remarkably simple.”

13. **G.W. Gibbons**, **AIP Conf.Proc. 1460 (2012) 90-100; arxive:1201.2340[gr-qc]**

The solutions for a black hole immersed in a magnetic field in Einstein-Maxwell-Dilaton theory have been given by Yazadjiev. The conjecture continues to hold.

14. **Shao-Wen Wei∗, Yu-Xiao Liu**, **Phys. Rev. D89 (2014) no.4, 047502**

“This conjecture was first made by Decanini and Folacci [13]. And subsequently, the relation was found by Stefanov, Yazadjiev, and Gyulchev [14] for a static, spherically symmetric black hole in an asymptotically flat spacetime.”

15. **Max Karlovini and Rikard von Unge**, **Phys. Rev D 72, 104013 (2005)**

“It would be interesting to see whether the inclusion of a dilaton could prevent the above-mentioned singularity from occurring. A general framework for distorted charged dilaton black holes has been provided by Yazadjiev [28].”

16. **Paul Halpern, Michael Pecorino, ISRN Astronomy and Astrophysics Volume 2013, Article ID 939876**

“The interior and exterior metrics of a dark energy star were calculated by Yazadjiev (Yazadjiev 2011) in 2011. The metrics depend on a mass parameter m, the radius r and an additional parameter _. From these, Yazadjiev determined an overall mass M (that includes the rest mass as well as dark energy) and a dark charge D,…”

“Applying the prescriptions of Einstein, Papapetrou and Moller to the exterior metric derived by Yazadjiev we will examine the localized energy of the dark energy star.”

“We have determined that Yazadjiev's solution representing a static, electrically-neutral, spherically symmetric massive object with phantom energy. In applying the Einstein, Papapetrou and Moller energy-momentum complexes to Yazadjiev's metric, we have found that each yields an identical localized energy equal to the mass M. This extends earlier results for Kerr-Schild objects such as the Schwarzschild solutionto an interesting case that could bear upon the dark energy question.”

17. **S. Mazharimousavi, M Halilsoy, I Sakalli and O Gurtug, Class. Quantum Grav. 27 (2010) 105005 (21pp)**

“By employing a similar method used by Yazadjiev [11] we investigate the stability of the possible EMD solution, in terms of a linear, radial perturbation”

S. Habib Mazharimousavi, M. Halilsoy, and Z. Amirabi, **Gen. Rel. Grav. 42 (2010) 261-280**

“In this chapter we follow a similar method used by Yazadjiev [11] to investigate the stability of the possible EYMD black hole solutions, introduced previously, in terms of a linear radial perturbation. Although this method is applicable to any dimensions we confine ourself to the five-dimensional black hole case given by Eq. (20)."

"By using the solution obtained by Yazadjiev in N = 4 EBID theory we wish to transform it to the space of colliding waves and to see whether it can be interpreted as colliding waves."

18. **K Kleidis , A Kuiroukidis , P Nerantzi, D B Papadopoulos**, **Gen. Rel. Grav. 42 (2010) 31-49**

" On the other hand, Yazadjiev [31], [32] used a technique of generating solutions, which creates exact cosmic-string backgrounds from known solutions to the Einstein equations coupled to a massless scalar field. In this way, he managed to describe the curved space-time around a non-rotating cosmic string interacting with gravitational waves in the Einstein-Maxwell-dilaton gravity (EMDg)."

19. **Shao-Wen Wei, Yu-Xiao Liu, Heng Guo, Phys. Rev. D84 (2011) 041501**

"In fact, there also exists a connection between the strong gravitational lensing and the quasinormal modes of spherically symmetric black holes in the eikonal regime, which was first guessed by Decabubu and Folacci [13] and was realized by Stefanov, Yazadjiev and Gyulchev [14]. "

20. **Ran Li, Eur. Phys. J. C73 (2013) no.2, 2296**

"More recently, P. I. Slavov and S. S. Yazadjiev [29] apply this semi-classical approximation method to compute the Hawking radiation of asymptotically non-flat dyonic black holes in four dimensional Einstein-Maxwell-dilaton gravity. They show that an analytical treatment of the semi-classical radiation spectrum of scalar field in nonextremal and extremal black holes can be established by solving the wave equations exactly."

21. **J. Kunz**, **Proceedings, 13th Marcel Grossmann Meeting on Recent Developments in Theoretical and Experimental General Relativity, Astrophysics, and Relativistic Field Theories (MG13) (Editors:** Remo Ruffini, Robert Jantzen, Kjell Rosquist**)**

"The generalization by Stoytcho Yazadjiev, on the other hand, gave a solution that describes several black lenses in equilibrium, where the electric charge of each black lense is zero. Moreover, the horizons are superconducting in the sense that they expel the magnetic flux lines.(62,63). The gravitational force between the black lenses is balanced by the tension of the compact dimension and their repulsive spin-spin interaction."

22. **Hideo Iguchi and Takashi Mishima, Phys. Rev. D 74, 024029 (2006)**

"For example, the supersymmetric black rings [8] and the black ring solutions under the influence of external fields [9] are found. The systematical derivation of these solutions and some generalizations were examined by Yazadjiev [10]. In addition the richness of the phase structure of Kaluza-Klein black holes has been discussed."

23. **Bertrand Chauvineau, Gen. Rel. Grav. 39 (2007) 297-306**

"In ref. [10], a solution describing a Bianchi I universe filled by stiff matter is shown to exhibit a non-zero residual scalar field in the limit . However, Yazadjiev has recently shown that, for some ST theories, including the BD case, the dilaton-matter lagrangian possesses some symmetries in the stiff matter case [11]. As a result, it turns out that GR solutions in presence of a massless scalar field generate BD solutions, in vacuum or in presence of stiff matter (but with a density which differs from that of the GR solution). Since the residual massless scalar field is precisely equivalent to stiff matter [11], one could suspect that the non-convergence of the stiff matter Bianchi I solution to the GR case could arise from the equivalence of stiff matter and massless scalar field, rather than to be a general property of BD solutions."

24. **Farook Rahaman, Piyali Bhar, Ritabrata Biswas, A. A. Usmani, Eur. Phys. J. C (2014) 74:2845**

"The study of interior solutions is rarely found in the literature. For example, solutions of Wolf [9] and Yazadjiev [10], solutions in the framework of the Brans–Dicke theory of gravity by Kozyrev [11] and a new class of solutions corresponding to BTZ exterior spacetime by Sharma et al. [12], which is regular at the center and it satisfies all the physical requirements except at the boundary where …"

25. **Chen Yu, BLACK HOLES IN FIVE DIMENSIONS WITH** R × *U*(1)2 **ISOMETRY, PhD thesis, DEPARTMENT OF PHYSICS, NATIONAL UNIVERSITY OF SINGAPORE (2010)**

"Firstly, all possible black hole horizon topologies have been classified by Hollands and Yazadjiev [38] using the rod structure formalism. "

"By defining a more mathematical version of the rod structure (known as the interval structure) that takes into account the global properties of the space-time, Hollands and Yazadjiev [38, 39] proved certain uniqueness theorems for stationary black holes which are either asymptotically $M1,D-1$, or asymptotically $M1,s \times TD-s-1$ where $0 < s < D - 1$ (see also [40] for more aspects of these space-times)."

26. **Yi Huan Wei, Class. Quantum Grav. 21 (2004) 831–838**

"Yazadjiev discussed the static, axisymmetric EMD field equations with arbitrary coupling and obtained several solutions [9]; this implies that the static, axisymmetric problem of EMD theory with electrostatic field may be uniformly solved for arbitrary coupling."

"Here, the simplification of the equations for the EMD theory has been completed on the basis of Yazadjiev's work [9]."

27. **G.W. Gibbons, Yi Pang and C.N. Pope, Phys. Rev. D89 (2014) no.4, 044029**

"Firstly, however, we remark that we can also allow B to become an additional thermodynamic variable in the first law, which will now be generalised to
dE = 8_dAH + dJ + _dQ − μdB , where μ has the interpretation of being the magnetic moment of the system. Analogous expressions have been obtained by for the case of Einstein-Dilaton-Maxwell theory in the Kaluza-Klein case by Yazadjiev [16]."

28. **Harold Erbin, Gen. Rel. Grav. 48:5 (2016)**

Supergravity rotating solutions is an intense field of research, and it is surprising that the (D)JN algorithm has almost never been applied in this context (with the exception of [7]). One explanation is that such theories present a number of gauge fields and complex scalar fields that could not be transformed in the original formulation of the DJN algorithm. For instance, Yazadjiev [7] showed that it was possible to obtain the metric and the dilaton of Sen's dilaton–axion charged rotating black hole [8]...

We will illustrate this proposal on several examples, all taken from N = 2 ungauged supergravity, completing Yazadjiev's analysis [7] of Sen's rotating black hole, and showing how some BPS rotating black holes from [11] can be obtained (which includes solutions from pure supergravity and from the ST U model).

29. **A. M. Setiawan and A. Sulaksono, AIP Conference Proceedings 1862, 030001 (2017).**

“**Abstract.** We study the effect of cracking of a local anisotropic neutron star (NS) due to small density fluctuations. It is assumed that the neutron star core consists of leptons, nucleons and hyperons. The relativistic mean field model is used to describe the core of equation of state (EOS). For the crust, we use the EOS introduced by Miyatsu et al. [1]. Furthermore, two models are used to describe pressure anisotropic in neutron star matter. One is proposed by Doneva-Yazadjiev (DY) [2] and the other is proposed by Herrera-Barreto (HB) [3]. The anisotropic parameter of DY and HB models are adjusted in order the predicted maximum mass compatible to the mass of PSR J1614-2230 [4] and PSR J0348+0432 [5]. We have found that cracking can potentially present in the region close to the neutron star surface. The instability due cracking is quite sensitive to the NS mass and anisotropic parameter used.”

“In the corresponding study, they used the anisotropic models which were proposed by Doneva-Yazadjiev (DY) [2] and Herrera-Barreto (HB) [3]. Reviews of the source of the appearance of pressure anisotropic in compact objects and the corresponding models used to accommodate pressure anisotropic for examples can be found in Reference [8, 9] “

“For anisotropic pressure models, we also use the ones of Doneva-Yazadjiev (DY) [2] and Herrera-Barreto (HB) [3].”

30. **Alrizal and A. Sulaksono, AIP Conference Proceedings 1862, 030014 (2017).**

“In this study, we assume that the pressure on the neutron stars can be anisotropic. Anisotropic means that there is a difference between radial and tangential pressure on the stars. Anisotropic models that we use in this study is the one proposed by Doneva and Yazadjiev with anisotropic factor[8].”

31. **Ciprian Dariescu, Marina-Aura Dariescu1, Cristian Stelea, Gen Relativ Gravit (2017) 49:153**

“The structure of our paper is as follows: in the next two sections we introduce the general Klein–Gordon equation for a massive and charged scalar field in the background of a magnetized neutronic star introduced by Yazadjiev in [11].”

“In our work, we are following an alternative approach and use the simple magnetar model introduced by Yazadjiev in [11]. This non-pertubative analytical solution has been obtained by adding (non-linearly) the magnetic field to a known static spherically symmetric solution to Einstein-hydrodynamic equations. While the solution generating technique presented in [11] can be used for a general static metric with axial symmetry, which is a solution of the Einstein equations in presence of a perfect fluid, in our work we shall limit ourselves to the case of spherically symmetric interior solutions.”

32. **Soumya Chakrabarti, Eur. Phys. J. C (2018) 78:296**

"Quite recently, Doneva and Yazadjiev showed that in a very similar setup of Scalar Einstein Gauss Bonnet theory (the conditons they imposed on the coupling function *f (φ)*are *f _ (φ* = 0*)* = 0 and *b*2 = *f* __ *(φ* = 0*)* > 0), there exists new black hole solutions which are formed by spotaneous scalarization of the Schwarzaschild black holes in the extreme curvature regime and below a certain mass, the Schwarzschild solution becomes unstable and new branch of solutions with nontrivial scalar field bifurcate from theSchwarzschild one [55]. They also proved the existence of neutron stars in a class of extended scalar-tensor Gauss-Bonnet theories for which the neutron star solutions are formed via spontaneous scalarization of the general relativistic neutron stars [56]."

33. **Emanuele Berti et. al, Class. Quant. Grav. 32 (2015) 243001**

"Yazadjiev et al. [151] recently went beyond the perturbative level constructing static equilibrium models of NSs in a theory of the form f(R) = R + λ_R2, where the coupling _ is not necessarily small. They found that deviations from GR are comparable with the variations due to uncertainties in the EOS, even for large values of λ."

"Yazadjiev et al. [155] constructed rapidly rotating NSs in nonperturbative f(R) = R + λR2 gravity. For fast rotation, the maximum NS mass and moment of inertia can be up to 16% and 60% larger than in GR, respectively. These corrections to the NS properties are large enough that, if observed, they may be used to constrain the parameter λ."

34. **CARLA CEDERBAUM AND GREGORY J. GALLOWAY, Class. Quant. Grav. 33 (2016) 075006**

"This definition and the resultant uniqueness result have since been adopted and generalized from vacuum to (nonextremal) electro-vacuum by Yazadjiev and Lazov [11]. They, too, assume that the lapse function of the spacetime regularly foliates the exterior region of the photon sphere."

"Then, photon spheres have the following local2 properties:

Proposition 2.4 (Cederbaum [2], Yazadjiev-Lazov [11]). Let (M3, g,N,_) be an electrostatic system solving the electro-vacuum equations (2.1)-(2.3), and let (P3, p) →̇ (R×M3,−N2 dt2+g) be a (generalized) photon sphere arising as the inner boundary of the associated spacetime (R ×M3,−N2 dt2 + g). We write □P3, p = □ R × _2,−N2dt2 + σ_= [I i=1 □ R × _2 i ,−N2i dt2 + σi_(2.9) , where each P3 i = R × _2i is a connected component of P3. Then the embedding (_2, σ) →̇ (M3, g) is totally umbilic with constant mean curvature Hi on the component _2i . The normal derivatives of the lapse function N and the electric potential _ in direction of the outward unit normal ν to _2, ν(N) and ν(_), respectively, are also constant on every component (_2i , σi), and we set ν(N)i := ν(N)|_2I , ν(_)i := ν(_)|_2 I. Moreover, the scalar curvature of the component (_2i , σi), _iR, is a non-negative constant which can be computed from the other constants via _Ri = 32H2i + 2_(ν(_)i) Ni_2 (2.10) . For each i ∈ {1, . . . , I}, either Hi = ν(_)i = 0 and _2i is a totally geodesic flat torus or _2iis an intrinsically and extrinsically round CMC sphere for which the above constants are related via NiH2 i (2.11) = 2ν(N)iHi."

35. **Vasileios Paschalidis, Nikolaos Stergioulas, Living Rev. Rel. 20 (2017) no.1, 7**

"In a recent paper, Doneva and Yazadjiev [205] studied rapidly rotating stars for the model lnA(φ) = βφ2/2, but this time extending it to the case of a massive scalar field by adding a potential V (φ) = m2 φφ2/2. In this case, In this case, the scalar field is short-range and observations practically leave the value of β unconstrained."

"Doneva and Yazadjiev find that the I − Q relation remains universal, but they deviate substantially (up to ∼ 20%) from those in general relativity. Thus, the I − Q relation could be used to infer deviations from general relativity."
"Motivated by the results found for static and slowly rotating stars in R2 gravity [800,708], Yazadjiev et al. modified the RNS code to allow for the construction of rapidly rotating neutron star models in R2 gravity in [799]. Adopting different equations of state, they find that rapid rotation enhances the discrepancy in global quantities such as mass, radius, and angular momentum between R2-gravity and general relativistic stars. Also, the differences become larger as the coupling constant a increases. Generically, the R2-gravity maximum neutron star mass is larger than the corresponding limit in general relativity. Yazadjiev et al. adopted a/M2 ⊙ ∈ [0, 104], which is within the Gravity Probe B constraint a . 5 × 105km2, but much larger than the E¨ot-Wash experiment constraint a . 10−16km2 [538]."

36. **MARCUS KHURI, ERIC WOOLGAR, AND WILLIAM WYLIE, *NEW RESTRICTIONS ON THE TOPOLOGY OF EXTREME BLACK HOLES*, arxiv:1804.01220[hep-th]**

"If multiple axial symmetries are present, namely the isometry group contains U(1)^D−3, then Hollands-Yazadjiev [23] have shown that the only possible horizon topologies are S3 ×T^(D−5), S^2 × T^(D−4), or L(p, q) ×T^(D−5), where T^(D−5) denotes the (D − 5)-dimensional torus."

37. **Rangavajhala Venkateswarlu, Janjeti Satish and Kakarlapati Pavan Kumar, Research in Astron. Astrophys. 2012 Vol. 12 No. 6, 636–642**

"The scalar-tensor gravity equations are much more complicated than the Einstein equations and their solution in the presence of a source is a very difficult task. That is why one should assume some simplifications in order to solve these scalar-tensor equations. In this way, many homogeneous cosmological solutions with a perfect fluid have been obtained. Some inhomogeneous scalar-tensor cosmologies have also been found and a method for generating general classes of exact scalar-tensor solutions with a stiff perfect fluid has been given by Yazadjiev (2002)."

38. **Hector O. Silva, Caio F. B. Macedo, Emanuele Berti, Luıs C. B. Crispino, Slowly Rotating Anisotropic Neutron Stars in General Relativity and Scalar-Tensor Theory, Class. Quant. Grav. 32 (2015) 145008**

"The calculations of [9] show that, if anisotropy occurs due to pion condensation, $0 \leq \tilde{\sigma}/\tilde{p} \leq 1$, therefore λH could be of order unity [46]. More recently, Nelmes and Piette [11] considered NS structure within a model consisting of a Skyrme crystal, which allows for the presence of anisotropic strains. They found that λH, as defined in Eq. (12), has a nearly constant value $\lambda H \approx -2$ throughout the NS interior. The nonradial oscillations of anisotropic stars were studied in [46] using the model of Eq. (12). Following Doneva and Yazadjiev [46], we will consider values of λH in the range $-2 \leq \lambda H \leq 2$…."

39. **Jun-Jin Peng, Wen-Chang Xiang, Shao-Hong Cai, CHIN. PHYS. LETT. Vol. 33, No. 8 (2016) 080401**

Yazadjiev presented new charged solutions that describe static black holes with squashed horizons in the five-dimensional Einstein–Maxwell–dilaton gravity.[2]

40. **I. Sakalli, A. Ovgun, and S.F. Mirekhtiary, Int.J.Geom.Meth.Mod.Phys. 11 (2014) no.08, 1450074**

"For this reason, we focus on the commonly acceptable NAF BHs in order to compute their TH by employing the HJ method. In the same line of thought, we consider the dBHs which are originally found by Yazadjiev [15]. The dBH solutions considered here have two horizons hiding a curvature singularity at the origin. As mentioned in [15], they may serve as backgrounds for non-supersymmetric holography and lead to possible extensions of AdS/CFT correspondence [16]"

41. Z. Motahar, J.~Blazquez-Salcedo, B.~Kleihaus and J.~Kunz, Neutron Stars With Realistic Equations Of State In Scalar-tensor Theories Of Gravity, Proceedings of 52nd Rencontres de Moriond on Gravitation (Moriond Gravitation 2017); p.279-282 (2017);

In further studies we might consider rapidly rotating neutron stars with realistic EOS in STT with new coupling functions. It would also be interesting to study a massive scalar field for new coupling functions. Indeed, Yazadjiev et al. [5,10] have studied a massive scalar field for slowly and rapidly rotating neutron stars and shown that the inclusion of a mass term for the scalar field leads to very interesting new results.

42. Cristian Stelea, Marina-Aura Dariescu, Ciprian Dariescu, *On magnetized anisotropic stars*, arxiv:1804.08075[gr-qc]

"One simple non-perturbative model of a magnetar, which is a solution of the full EinsteinMaxwell-hydrodynamic equations has been proposed recently by Yazadjiev in [16]. Yazadjiev's model describes a static magnetized neutron star, with a poloidal magnetic field. Its fluid distribution becomes anisotropic due to the presence of the magnetic field. This model was obtained using a solution generating technique by adding a magnetic field to a general static metric, solution of the Einstein-perfect fluid model. This solution is very important since it provides in a fully relativistic context a simple analytical model of the magnetars."

"The structure of our paper is as follows: in the next section we present in simple form the extension of the Yazadjiev's procedure to add a magnetic field to a static configuration describing an anisotropic fluid."

"In this work we have considered an extension of Yazadjiev's method to magnetize an anisotropic fluid distribution in full generalyl relativistic context. Our initial motivation was to search for more general models of magnetars with poloidal magnetic fields and in this regard the extension of Yazadjiev's method to anisotropic fluid distributions is quite natural."

43. Marcus Khuri, Eric Woolgar, William Wylie, Lett. Math. Phys., 109 (2019), no. 3, 661-673; arXiv:1804.01220 [hep-th]

“If multiple axial symmetries are present, namely the isometry group contains U(1)D−3, then Hollands-Yazadjiev [26] have shown that the only possible horizon topologies are S3 ×TD−5, S2 × TD−4, or L(p, q) ×TD−5, where TD−5 denotes “the (D − 5)-dimensional torus.”

44. Francesco Cremona, Francesca Pirotta, Livio Pizzocchero, General Relativity and Gravitation (2019) 51:19; arXiv:1805.02602 [gr-qc]

“The family of Bronnikov solutions depends on a “mass” parameter, which is zero in the case (1.2) (1.3); see the recent paper of Yazadjiev [5] for an important uniqueness result on this family, and for a representation (in Eqs. (15)(16) of the cited article) …”

45. Ayan Banerjee, M. K. Jasim, Anirudh Pradhan, Modern Physics Letters AVol. 35, No. 10, 2050071 (2020); arXiv:1911.09546 [gr-qc]

“In [21], Yazadjiev found a class of exact interior solutions describing mixed relativistic stars. According to the model dark energy was provided by scalar fields with negative kinetic energy. Whereas the dark energy imprints in gravitational wave spectrum of mixed neutron-dark energy stars…..”

46. Daniela Pérez, Gustavo E. Romero, Topics on Strong Gravity, A Modern View on Theories and Experiments, https://doi.org/10.1142/11186 | January 2020; arXiv:2001.00863 [gr-qc]

“Later, it was pointed out by Yazadjiev and coworkers29 that the use of the perturbative method to investigate the strong eld regime in f(R)- theories may lead to unphysical resultsd. In order to obtain self-consistent models of NSs, they suggested to solve the eld equations simultaneously, assuming appropriate boundary conditions…””

“Recently, Blazquez-Salcedo et al. investigated the axial quasi-normal modes of the neutron star model in R-squared gravity developed by Yazadjiev and coworkers.”

47. A. Mathew, M, Shafeeque, M. Nandy, The European Physical Journal C volume 80, Article number: 615 (2020), arXiv:2006.06421 [gr-qc]

“Yazadjiev et al. [32] solved for the stable configurations of neutron stars in the Starobinsky model f(R) = R + a R2 for increasing values of the parameter a. By constructing an equivalent scalar-tensor theory, they obtained the stellar structure non-perturbatively and compared their results with perturbative estimates.While the perturbative result was unphysical because it gave a decreasing mass with respect to the radial distance in a region interior to the star [33], no such unphysical behaviour was observed in the non-perturbative framework.”

48. Igor Bogush, Gérard Clément, Dmitri Gal'tsov, Dmitrii Torbunov, Phys. Rev. D 103, 064045 (2021); arXiv:2009.07922 [gr-qc]

“Generally, these solutions are naked singularities, except particular cases of singular black holes in the vicinity of $\alpha = n\pi$, $n \in Z$ (fig.6 right). This conclusion is consistent with the uniqueness theorem. In [49] Yazadjiev proved the uniqueness of asymptotically flat regular black holes (without NUT) with respect to charges M,Q, P and rotation J. We can expect that static black hole solutions with NUT charge should be uniquely defined by the four charges M,N, P,Q.”

49. M. Sakti, A. Sulaksono, Phys.Rev.D 103 (2021) 8, 084042 ; 2103.15393 [gr-qc]

“It is calculated by Yazadjiev [25] using his method in [26] that one can obtain an interior solution of the Einstein field equation containing an ordinary matter and a scalar phantom field with no phantom potential. The equation of motion of this system is described by…”

50. Kent Yagi, Nicolas Yunes, Physics Reports, Vol. 681, 7 April 2017, Pages 1-72; arXiv:1608.02582 [gr-qc]

“Following Doneva and Yazadjiev [224], Silva et al. [222] and Yagi and Yunes [223], we focus on .... Higher order spin corrections to 0 are determined self-consistently by solving the perturbed Einstein equations order by order in the small-rotation expansion [223].”

“Doneva and Yazadjiev [324] found that the universality in the I-Q relation is worse than that in GR, though the former remains equation-of-state universal within a few percent for a fixed fsM (where we recall fs is the stellar spin frequency). They also found that such a relation deviates from that in GR by 20% at most ...”