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# Seifert Manifolds

**seifert manifolds - mathny** - manifolds, and it is now time to construct examples. a rich and important source is a family of manifolds built by seifert in the 1930s, which generalises circle bundles over surfaces by admitting some "singular" fibres. the three-manifolds that admit such kind of fibration are now called seifert manifolds. **on symplectic fillings of small seifert -manifolds arxiv ...** - on symplectic fillings of small seifert 3-manifolds  $3 \text{ cap } k$  is a neighborhood of symplectic 2-spheres, the adjunction formula and in-tersection data impose a constraint on the homological data of  $k$  in  $x$ . **0.1 seifert bundles and seifert manifolds** - 0.1 seifert bundles and seifert manifolds a seifert manifold is a 3-manifold that is "made up" of simple closed curves whose neighborhood (a solid torus) has a certain property. we may instead think about seifert bundles, a special case of which are equivalent to seifert manifolds (section 5.2 in [orl72]). definition 0.1.1. **seifert manifolds admitting partially hyperbolic ...** - seifert manifolds admitting partially hyperbolic diffeomorphisms every circle bundle over  $S^1$  can be obtained from  $S^1 \times S^1$  by removing a solid torus of the form  $d \times S^1$  (with  $d \times S^1$  a two dimensional disk) and regluing by a map preserving the vertical fibers and giving rise to a new 3-manifold  $M$  which is a circle bundle over  $S^1$  in a trivial way. **chern-simons theory on a general seifert 3-manifold** - out seifert 3-manifolds among all possible 3-manifolds as those to which diagonalisation (at least as understood by us at present) can be applied. a notable feature of this approach to the calculation of the chern-simons partition function of seifert 3-manifolds [7] is that it completely bypasses the (possibly arduous) **seifert fibered manifolds and dehn surgery iii - intlpress** - seifert fibered manifolds and dehn surgery iii 553 figure 1.1 example 3. let  $k$  be a satellite knot such that  $(k|r)$  is seifert fibered. if  $(k|r)$  is non-simple or  $\text{t}(k|r)$  is finite, then [25] or [4], respectively shows that a torus knot is a companion of  $k|r$  the seifert fibration of the torus knot exterior extends over  $(k|r)$ . **3d-3d correspondence for seifert manifolds** - in this dissertation, we investigate the 3d-3d correspondence for seifert manifolds. this correspondence, originating from string theory and m-theory, relates the dy-namics of three-dimensional quantum field theories with the geometry of three-manifolds. **introduction to 3-manifolds - arizona state university** - introduction to 3-manifolds the 3-torus is a 3-manifold constructed from a cube in  $R^3$ . let each face be identified with its opposite face by a translation (without twisting). you can imagine this as a direct extension from the 2-torus we are comfortable with. if you were to sit inside of a 3-torus **on spines of seifert fibered manifolds - researchgate** - aequationes math. 65 (2003) 40-60 0001-9054/03/010040-21 © birkhäuser verlag, basel, 2003 aequationes mathematicae on spines of seifert fibered manifolds beatrice ruini, fulvia spaggiari and ... **parallel transport along seifert manifolds and fractional ...** - parallel transport along seifert manifolds and fractional monodromy 431 fig.2. representation of a curled torus. take a cylinder over the figure 'eight', as shown in (a) the upper and lower halves of this cylinder after rotating the upper part by  $\pi$  resulting surface is a curled torus (b) fig. 3. **structure sets vanish for certain bundles over seifert ...** - results for some non-haken 3-manifolds with finite-sheeted covers which are haken (these are now known as "virtually haken" manifolds—see [13]). an argument of this sort is given in plotnick's paper [19] and will be generalized here. this paper is concerned with orientable seifert manifolds a 3 over orientable **an alternative manifold for cosmology using seifert ...** - fert manifolds. for hyperbolic spaces we will use thurston's theory. then we will use all those concepts for the construction of a new manifold representing the cosmological universe. seifert manifolds definition 1. a seifert fibered manifold (sfm) is an orientable three-manifold  $M$ ,  $M$  is the collection **the classification problem for 3-manifolds** - a happy accident: all spherical 3-manifolds are seifert manifolds, with base  $S^2$  and at most 3 exceptional fibers. the type ii manifold  $S^1 \times S^2$  is also clearly a seifert manifold.  $M$  irreducible  $(M)$  can't be simplified by splitting along spheres. the remaining seifert manifolds are all of type iii, with the sole **seifert manifolds - sogang** - 2 1. classical 3-dimensional seifert manifolds there are 8 seifert geometries in dimension 3.  $\chi > 0$   $\chi = 0$   $\chi$  flat conformal structures on 3-manifolds, i ... - 3-manifolds, i: uniformization of closed seifert manifolds michael kapovich abstract this is the first in a series of papers where we prove an existence theorem for flat conformal structures on finite-sheeted coverings over a wide class of haken manifolds introduction a flat conformal structure on a manifold  $M$  (of dimension  $n > 2$ ) is a maximal atlas **notes on basic 3-manifold topology** - chapter 2. special classes of 3-manifolds 1. seifert manifolds. 2. torus bundles and semi-bundles. chapter 3. homotopy properties 1. the loop and sphere theorems. these notes, originally written in the 1980's, were intended as the beginning of a book on 3 manifolds, but unfortunately that project has not progressed very far since then. **lecture notes in mathematics - maths.ed** - manifolds with  $f+t = 0$  belong to the classes  $0,0$  and  $n,ni$  of seifert  $e_i$ ] and together with the other seifert manifolds (introduced in chapter 5) will be the main topic of these notes. 1.1. manifolds and groups a topological space  $X$  is a set with certain subsets  $U_i$  distinguished by being called open. **quantum invariants of seifert 3-manifolds and their ...** - 3 quantum invariants of seifert manifolds in this section we explain our calculation of the  $g$ {invariants of the seifert manifolds,  $g$  being an arbitrary complex finite dimensional simple lie algebra. our starting point is a formula for the  $rt$ {invariants associated to an arbitrary modular category of the seifert manifolds, derived in [11]. **seifert fibred knot manifolds - university of sydney** - seifert fibred knot manifolds 3 parity and common factors of the cone point orders follow also from the fact that  $= 0$  is cyclic

and the above observations on determinants, while the lower bounds on the numbers of cone points and corner points **symplectic rational blow-down along seifert fibered 3 ...** - 3 tight contact structures on certain seifert fibered 3-manifolds in order to find the right gluing map for performing the rational blow-down process, we will invoke a classification result of tight contact structures on certain small seifert fibered 3-manifolds. let us start with some generalities. **branched coverings and nonzero degree maps between seifert ...** - two such manifolds (see theorem 3.0 in section 3). as a consequence, we show that for a given aspherical, closed, oriented seifert manifold  $M$  and a nonzero integer  $d$ , there are only finitely many such seifert manifolds  $N$  such that there is a degree  $d$  map  $f: M \rightarrow N$  (see corollary 3.1).

1. two general facts about branched coverings of seifert manifolds **an introduction to 3-manifolds** - we will then shift our attention to 3-manifolds. in the third section we will first introduce various examples of 3-manifolds, e.g. lens spaces, seifert fibered spaces, fibered 3-manifolds and exteriors of knots and links, we will furthermore see that new examples can be constructed by connected sum and by gluing along tori. **canonical decomposition of 3-manifolds** - the manifolds listed above. proposition. in a seifert manifold, all 2-sided horizontal surfaces are essential. all 2-sided vertical surfaces are essential except a torus bounding a solid twisted torus containing at most one multiple ber, or an annulus which splits a solid torus from  $M$ . lemma. if  $M$  is compact, connected, orientable, irreducible, **chern-simons theory on spherical seifert manifolds ...** - chern-simons theory on spherical seifert manifolds, topological strings and integrable systems ga etan borot1 and andrea brini2 abstract we consider the gopakumar-ooguri-vafa correspondence, relating  $u(n)$  chern-simons theory at large  $n$  to topological strings, in the context of spherical seifert 3-manifolds. these are quotients **tight and fillable contact structures on seifert fibered ...** - seifert fibered manifolds borrow their name from their decomposition into disjoint simple closed curves (called bers) such that each ber has a tubular neighborhood which forms a standard fibered torus (that is, a solid torus foliated into the core and the curves of the same rational slope on all concentric tori). **mathematical proceedings of the cambridge philosophical ...** - manifolds is asserted (but not proved) for  $w$ -knots,  $n > 3$  (see [5, 6, 13]). one purpose of this paper is to show that, in fact, minimal seifert manifolds do not always exist. **adiabatic limits of the seiberg-witten equations on ...** - seifert manifolds and they are intimately related to thurston's geometries. adiabatic limits of the seiberg-witten equations 335 1.1. basic objects. consider an oriented 3-manifold  $N$ . definition 1.1. (a) an almost contact structure on  $N$  is a nowhere vanishing 1-form  $\eta \in \Omega^1(N)$ . **seifert surfaces and genera of knots - yale university** - seifert surfaces and genera of knots michael landry june 2014 these are the lecture notes for a colloquium talk on knot theory given to undergraduates at the summer undergraduate mathematics research at yale (sumry) program. since i learned knot theory from colin adams' excellent book [1], the treatment here is similar, but with my own **matematisk seminar 7 universitetet i oslo on seifert ...** - this paper is an investigation of certain 3-manifolds (subsequently called seifert-manifolds or simply manifolds) described by seifert (1) - the seifert-manifolds are compact, connected 3-manifolds with the property that they admit a **transverse contact structures on seifert 3-manifolds** - transverse contact structures on seifert 3-manifolds 1127 the main results of eisenbud, hirsch, jankins, neumann and naimi on the existence of transverse foliations can be summarized in the following statement. theorem 1.2 [1, 10, 14] let  $p: M \rightarrow \Sigma_g$  be an oriented three-dimensional seifert fibration as above. **an invariant of cauchy-riemann seifert 3-manifolds and ...** - an invariant of cauchy-riemann seifert 3-manifolds and applications olivier biquard and marcherzlich abstract. we compute a recently introduced geometric invariant of strictly pseudoconvex  $cr$  3-manifolds for certain circle invariant spherical  $cr$  structures on seifert manifolds. we give applications to ... **geometric seifert 4-manifolds with hyperbolic bases** - geometric seifert 4-manifolds with hyperbolic bases michael kemp seifert fibered 3-manifolds were originally defined and classified by seifert in [2]. scott (in [1]) gives a survey of results connected with these classical seifert spaces, in particular he shows they correspond to 3-manifolds having one of six of the eight 3-dimensional **virtual properties of 3-manifolds - ucb mathematics** - virtual properties of 3-manifolds 5 figure 3. examples of hyperbolic manifolds of finite volume (a) seifert-weber space (b) figure 8 knot (c) whitehead link 3. virtual properties of 3-manifolds recall that a compact aspherical 3-manifold  $M$  is haken if it contains an embedded  $\pi_1$ -injective surface (e.g. a knot complement). the seifert-weber **explicit horizontal open books on some seifert fibered 3 ...** - [eo], explicit open books were constructed on seifert fibered 3-manifolds which can be described by non-positive standard plumbing diagrams. moreover it was shown that these open books are horizontal with respect to the circle bundles involved in the plumbing descriptions of the seifert fibered 3-manifolds at hand. **a theorem of borsuk-ulam type for seifert-fibered 3-manifolds** - a theorem of borsuk-ulam type for seifert-fibered 3-manifolds by kenneth millett university of california, santa barbara, ca 93106, u.s.a. and dale rolfsen university of british columbia, vancouver, b.c. v6t 1y4, canada (received 25 october 1985; revised 11 february 1986) 1. introduction **an introduction to 3-manifolds and their fundamental groups** - manifolds comes from the geometrization theorem conjectured by thurston and proved by perelman. the theorem says that any prime manifold can be constructed by gluing seifert fibered spaces and hyperbolic manifolds along incompressible tori. in section 7 we will report on the recent resolution of thurston's virtual bering conjecture due to agol **conformally flat structures on 3-manifolds: existence problem** - that  $M$ , when obtained by gluing hyperbolic and seifert pieces together along tori, does not contain

combinations of hyperbolic manifolds with hyperbolic or euclidean manifolds (in the sense of [4]). then there exists a finite-sheeted cover  $m \rightarrow M$  over  $M$  which admits a uniformizable cfs. **dehn fillings of knot manifolds containing essential** - dehn fillings of knot manifolds containing essential once-punctured tori  $T^2 \times S^1$  can explicitly describe the branch set  $\text{Im} \alpha \cap \text{Im} \beta$ . comparing this description with the constraints we have already deduced on  $M$  leads to the proof of the theorem. recall that an exceptional filling slope on the boundary of a hyperbolic 3-manifold is a slope **finite type invariants for knots in 3-manifolds** - seifert manifold, and we use work of scott [21] to handle non-haken seifert manifolds. the paper is organized as follows: in section 1 we recall from [17] the generic picture of a family of maps from a compact 1-polyhedron into a 3-manifold, parameterized by a disc. **contact topology and hydrodynamics: beltrami fields and ...** - the question of whether vector fields on three-manifolds are forced to exhibit periodic solutions has a rich history (see, e.g., [45, 44]). the following conjecture of seifert has been a focus of inquiry: the seifert conjecture every closed vector field on  $S^3$  possesses a closed orbit. **review article a survey on seifert fiber space theorem** - review article a survey on seifert fiber space theorem ... known as seifert manifolds or seifert fiber spaces they have been since widely studied, well understood, and ... seifert fiber space conjecture (s.f.s.c. for short). at first was the center conjecture (1960s), then the torus theorem **dehn fillings of large hyperbolic -manifolds** - dehn fillings of 2-sphere with at most three cone singularities, or a projective plane with at most one cone singularity, are called small seifert manifolds. other-wise they are called big seifert they are called very big seifert if they are big seifert but do not have a base orbifold of the form  $P^2(p, q)$ , or  $S^2(2, 2, 2, 2)$ , or the klein bottle  $K$ . evidently the generic seifert fibred **calabi-yau compactification m. seifert** - calabi-yau compactification m. seifert march 10, 2004 1 introduction when asked about the ten-dimensional nature of superstring theory, richard feynman once replied, "the only prediction [string theory] makes is one that has to be explained away because it doesn't agree with experiment." [8] in a sense, this skepticism is not unfounded, and if ... **commensurability and virtual fibration for graph manifolds** - seifert manifolds,  $M_1$  and  $M_2$ , each having a torus as its boundary, along these tori. suppose also that neither half  $M_i$  is the total space  $S^1 \times B^2$  of the circle bundle over the  $M$  mobius band with orientable total space (otherwise there is a double cover of  $M$  that either satisfies our requirements or is a torus bundle over the circle and is thus ...

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