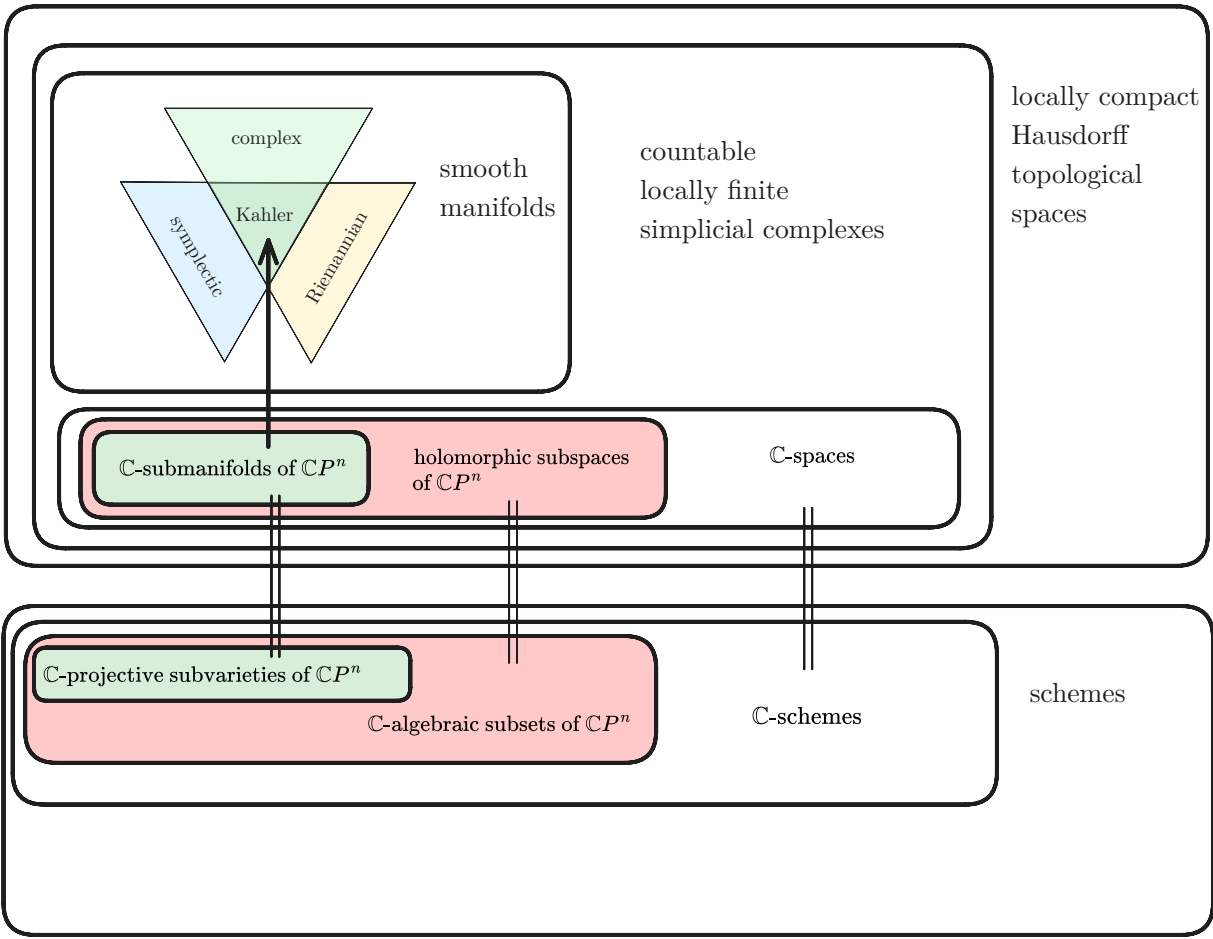


Info

This note, that [was found here](#), as a part of [a collection](#) is written (completely with human hands) by [Rupadarshi Ray](#), was created on December 2, 2025 5:03:41 PM, was last modified on September 3, 2026 11:36:24 AM, and was exported on September 7, 2026 3:09:45 PM.

stem



objects stemming from manifolds

- [Objects stemming from \$\mathbb{R}\$ -manifolds of dimension 3](#)

objects stemming from groups

	rank 1	rank 2	rank 3	rank 4	
dim 2	Objects stemming from $PSL(2)(\mathbb{R})$				
dim 3	Objects stemming from $PSL(2)(\mathbb{C})$				
dim 4					

The direct children are as follows.

- [stem](#)
 - $GL(n)$
 - $GL(n)(\mathbb{C})$
 - $GL(n)(\mathbb{R})$
 - [Knots](#)
 - [Objects stemming from spaces over \$\mathbb{Q}\$](#)
 - [Objects stemming from \$\mathbb{R}\$ -spaces of dimension 2](#)
 - [Objects stemming from \$\mathbb{R}\$ -spaces of dimension 3](#)
 - [Objects stemming from \$\mathbb{R}\$ -spaces of dimension 4](#)
 - [subobjects of and functions on \$\mathbb{R}^n, S^n, \mathbb{C}^n\$ and its quotients \$\Gamma \backslash \mathbb{R}^n, \Gamma \backslash \mathbb{C}^n\$](#)
 - [Convex sets in \$\mathbb{R}^n, \mathbb{R}H^n\$ or \$S^n\$](#)
 - [Objects stemming from \$\mathbb{R}\$ -semi-simple/reductive Lie groups](#)
 - [Objects stemming from \$PSL\(2\)\(\mathbb{C}\)\$](#)
 - [Objects stemming from \$PSL\(2\)\(\mathbb{R}\)\$](#)

Current note has 13 direct children and 298 total descendants.

- [stem](#)
 - $GL(n)$
 - $T, \dagger$ -closed subgroups of $GL(n)$
 - T -closed Lie subalgebras are reductive
 - $GL(n)(\mathbb{C})$
 - [Zariski closure of subgroups of \$GL\(n, \mathbb{C}\)\$](#)
 - $GL(n)(\mathbb{R})$
 - T -closed, closed subgroups of $GL(n, \mathbb{R})$
 - [Subgroups of \$GL\(n, \mathbb{R}\)\$](#)
 - [Compact subgroups of \$GL\(n\)\(\mathbb{R}\)\$](#)
 - T -closed, $\exp$ -closed closed subgroups of $GL(n, \mathbb{R}) \leftrightarrow$ [completely geodesic submanifolds of \$Pd\(n, \mathbb{R}\)\$](#)
 - [HomGrp](#)
 - $\text{HomGrp}(F_2, G)$
 - [Knots](#)
 - [Braids](#)
 - [Knot and link diagrams on \$\mathbb{R}^2\$](#)
 - [Knots in \$\mathbb{R}^3\$](#)
 - [Left trefoil knot](#)

- Complement of knots in $\mathbb{R}^3$ or S^3
- Genus of a knot
- Fundamental group of the complement of the knot
- Linking number invariant of links
- $O^+(1, n)$
 - Subgroups of $O^+(1, n)(\mathbb{R})$
 - Limit set of subgroups
 - Discrete subgroups of $O^+(1, n) \leftrightarrow$ hyperbolic n -manifolds/orbifolds
 - Convex cocompact discrete subgroups
 - Combination of discrete subgroups of $O^+(1, n)(\mathbb{R})$
 - Exponential sum of a discrete subgroup of $\text{Isom}(\mathbb{R}H^n)$
 - $\text{RepDF}(F_g, O^+(1, n)(\mathbb{R}))$
 - Measure homology on a hyperbolic manifold
 - Discrete subgroups with limit set a discontinuum
 - Limit sets of discrete subgroups
 - Conical limit set
 - Discrete subgroups with limit set a $k - 1$ -sphere
 - Counting orbits of discrete subgroups of $O^+(1, n)(\mathbb{R})$ in $\mathbb{R}H^n$
 - Rigidity of $\mathbb{R}$ -hyperbolic manifolds
 - Using ergodic current on $\partial^2 \mathbb{R}H^n$
 - Rigidity using measure homology
 - Rigidity of lattices using quasi-conformal mappings
 - Schottky
 - Classical Schottky subgroups of $O^+(1, n)$
 - Schottky subgroups of $O^+(1, n)$
 - $\text{RepDF}(\pi_1(T_g^2, \bullet), O^+(1, n)(\mathbb{R}))$
 - Objects stemming from spaces over $\mathbb{Q}$
 - Elliptic curves over $\mathbb{Q}$
 - Algebraic number fields
 - Objects stemming from $\mathbb{R}$ -spaces of dimension 2
 - Riemann surfaces
 - Vector bundles on complex 1-manifolds
 - Classification of complex 1-manifold
 - Riemann's existence of holomorphic maps between compact Riemann surfaces
 - Divisors on compact Riemann surfaces
 - Fluid
 - Meromorphic differentials on Riemann surfaces
 - Holomorphic functions on a complex 1-manifold
 - Global holomorphic functions on a complex 1-manifold
 - Global algebraic functions on a complex 1-manifold
 - Non-constant holomorphic maps between Riemann surfaces locally looks like w^k and are open maps
 - Holomorphic maps of type $0 \xrightarrow{3} 0$
 - Rational maps
 - Hurwitz scheme
 - Moduli space of $\mathbb{C}$ -manifolds
 - Meromorphic functions on a Riemann surface
 - Normalization of plane projective $\mathbb{C}$ -curves and Riemann surfaces
 - Riemann surfaces defined over a number field
 - Hyperelliptic Riemann surfaces
 - $T_{\mathbb{C}}$
 - $\text{Sym}^2(T^{(1,0)}X) \twoheadrightarrow X$
 - Differential forms on complex 1-manifolds
 - Riemann surfaces with a holomorphic 1-form
 - $\mathbb{C}$ -analytic spaces of dimension 1
 - Riemann quasiconformal surfaces
 - Teichmuller space of surfaces
 - Objects stemming from $\mathbb{R}$ -spaces of dimension 3
 - Objects stemming from $\mathbb{R}$ -spaces of dimension 4
 - subobjects of and functions on $\mathbb{R}^n, S^n, \mathbb{C}^n$ and its quotients $\Gamma \backslash \mathbb{R}^n, \Gamma \backslash \mathbb{C}^n$
 - Holomorphic functions on spaces over $\mathbb{C}$ of dimension 1
 - Approximation of holomorphic functions on $\mathbb{C}$ by rational functions
 - Embedding unit disk D into $\mathbb{C}^3$
 - Factorization of holomorphic functions on $\mathbb{C}$
 - Global holomorphic functions
 - Equivalent descriptions of holomorphic functions
 - Cauchy integral formula for holomorphic functions
 - Derivative of holomorphic functions
 - Integral of holomorphic differential forms
 - Convergent power series
 - mapping
 - Bounding derivative of holomorphic mappings
 - Bounding holomorphic functions linearly
 - Branch points and ramification index of holomorphic functions
 - Disk in holomorphic image of disk
 - Size of holomorphic image of disks
 - Maximum and minimum of holomorphic functions
 - Fibers of holomorphic mappings
 - Non-constant holomorphic functions locally look like w^k and are open mappings

- [Biholomorphic mapping onto disk](#)
 - [Conformal radius of pointed simply connected open subsets of \$\mathbb{C}\$](#)
 - [Holomorphic functions on punched disk](#)
 - [Holomorphic function whose singularities are not isolated](#)
 - [A holomorphic map branched over \$\mathbb{Q}\$](#)
- [Meromorphic functions on the complex plane](#)
- [Holomorphic functions meromorphic at infinity](#)
- [Modular forms](#)
- [Reconstructing meromorphic functions from stalks](#)
- [Extending holomorphic functions by reflections](#)
- [Rotational symmetrization of holomorphic functions](#)
- [Sheaf of holomorphic functions on \$\mathbb{C}\$](#)
- $\mathcal{O}(U)$
 - [Pre-compact subsets of \$\mathcal{O}\(U\)\$](#)
 - [Sequences of holomorphic functions](#)
- $\mathcal{O}(\mathbb{C})$
- $\mathcal{O}(D)$
 - [Boundary values of \$\mathcal{O}\(D\)\$](#)
 - $\mathcal{O}(\overline{D})$
 - $\mathcal{O}(D) \cap \mathcal{C}(\overline{D})$
 - $\mathcal{O} \cap L^2(D)$
 - [Reconstructing \$\mathcal{O}\(D\)\$ from its boundary values](#)
- $\mathcal{O}^p(H_{\mathbb{U}}^2)$
- $\mathcal{O} \cap L^p$
- $\mathcal{O}(S^1)$
- [Zeros and singularities of holomorphic functions](#)
- [An](#)
 - [Analytic functions on the circle](#)
- [Open subsets of \$\mathbb{R}^n\$ with \$\mathcal{C}^2\$ boundary](#)
- [Complex ODEs in \$\mathbb{C}\$](#)
 - [Complex ODEs of order 2 in \$\mathbb{C}\$](#)
- [Circle packing on \$\mathbb{R}^2\$](#)
- [Circle packing converges to the Riemann biholomorphism](#)
- [Bounded connected open subsets of \$\mathbb{C}^n\$](#)
- [Connected circular open subsets of \$\mathbb{C}^n\$](#)
- [Continuous functions on \$\mathbb{R}^d\$](#)
 - $\mathcal{C}_0[0, 1]$
 - [Continuous functions on \$\mathbb{R}\$ with infinite limit are uniformly continuous](#)
 - [Intermedia value property of continuous functions on intervals](#)
 - $\mathcal{C}(U, X)$
 - $\mathcal{C}[0, 1]$
 - [Dual space of \$\mathcal{C}\[0, 1\]\$](#)
 - [Riemann integral functional \$\int_{\[a,b\]} : \mathcal{C}\[a, b\] \rightarrow \mathbb{R}\$](#)
- [Dyadic cubes](#)
- [Curves](#)
 - [Arc length](#)
 - [Congruent curves](#)
 - [Curvature of a curve](#)
 - [Reparameterization of a parameterized curve](#)
 - [Tangent of a curve](#)
 - [Unit speed parameterization of a curve](#)
- [dense](#)
 - [Nowhere differentiable functions are dense in \$\mathcal{C}\[0, 1\]\$](#)
 - [Basis of functions on \$\[0, 1\], S^1\$](#)
- [Differentiable functions](#)
 - [Functions \$\(a, b\) \rightarrow \mathbb{R}\$ differentiable at a point](#)
 - [Comparing a function and it derivative](#)
 - [Absolutely continuous functions on \$\[a, b\]_- \leftrightarrow_- \int_{\[a,-\]} \(L^1\[a, b\]\)\$](#)
 - [Distributional derivatives](#)
 - [Fractional Sobolev spaces](#)
 - $H^1(U)$
 - H_{loc}^1
 - $H_{\text{loc}}^1(U)$ for $U \subseteq \mathbb{R}^2$
 - [Double derivative/Laplace operator on the circle](#)
 - [Fractional derivative](#)
 - [Infinite limit of derivatives](#)
 - [Space of continuous and continuously differentiable functions on \$\mathbb{R}\$](#)
 - $\mathcal{C}^1([a, b], \mathbb{R})$
 - [Derivative operator on \$\mathcal{C}^1\[a, b\]\$](#)
 - $(\mathcal{C}^1([a, b], \mathbb{R}), \|\cdot\|_{\infty})$
 - $\mathcal{C}_{\text{c}}^k((a, b), \mathbb{R})$
 - [Derivative of maps \$\mathbb{R}^n \rightarrow \mathbb{R}^m\$](#)
 - [Zooming of a map \$\mathbb{R}^n \rightarrow \mathbb{R}^m\$](#)
- [equations](#)
 - [Equations for functions on \$\mathbb{R}^2\$](#)
 - [Quasi-linear PDEs on \$\mathbb{R}^2\$](#)
 - $$\partial_t^2 + \sum_{i=1}^n v_i^2 \partial_{x_i}^2 + m^2$$
 - [First order PDEs in \$\mathbb{R}^n\$](#)

- $\partial_t^2 + \sum_{i=1}^n v_i^2 \partial_{x_i}^2$
- Differential forms on $\mathbb{R}^n$
 - de Rham cohomology in $\mathbb{R}^n$
- Fourier-Wigner transform
- Fourier
 - Fourier transform on $L^2(-A, A) \leq L^2(\mathbb{R})$
 - $\frown : L^2(0, \infty) \cong_{\text{Hilb}} \mathcal{O}^2(H_{\mathbb{U}}^2)$
 - Fourier transform on $\mathbb{R}^n$
 - Fourier transform on S^1 , Fourier series on $[0, 1]$
 - Functions on S^1 with absolutely converging Fourier series, $\check{l}^1(S^1)$
 - Fourier transform of distributions on S^1
 - $\frown : L^1[0, 1] \rightarrow \mathcal{C}_0(\mathbb{Z}, \mathbb{C})$
 - $\frown : L^2[0, 1] \cong_{\text{Hilb}} l^2(\mathbb{Z}, \mathbb{C})$
 - Fourier transform of measurable subsets
 - Unsharpness principles
- Harmonic functions composed with conformal maps
- Hilbert transform
- Fourier-Cauchy-Poisson correspondence of holomorphic and harmonic functions on the unit disk and their boundary values
- Holomorphic subsets of $\mathbb{C}^n$
- Regular hypersurfaces in $\mathbb{R}^{2n}$
- Orientable hypersurfaces in $\mathbb{R}^n$
- int
 - Integration by parts
 - Laplace's method for approximating integral of e^{Mf} for large M
 - Integral on bounded open subsets of $\mathbb{R}^n$ with $\mathcal{C}^1$ boundary
 - Riemann-Darboux and Riemann-Stieltjes integrals
- Laplace operator on $\mathbb{R}^n$
 - Laplace operator on (flat) upper half space
- $l^\infty(\mathbb{R})$
- Lebesgue measurable subsets of and functions on $\mathbb{R}^n, T^n, S^n$
 - Functions with uniformly bounded mean oscillations on cubes
 - Decomposition of $f \in L^p$ into bounded and unbounded parts
 - Calderon-Zygmund decomposition
 - Lebesgue density of measurable sets
 - Functions with uniformly bounded mean oscillations on dyadic cubes
 - Volterra operator $\int_{[0, -]} : L_{\text{loc}}^1[0, 1] \rightarrow \mathcal{C}[0, 1]$
 - Volterra operator $\int_{[0, -]} : L^p[a, b] \rightarrow L^p[a, b]$
 - Measurable functions on $\mathbb{R}^n$
 - (ϵ, n) -measurable function
 - Integrability and integral of measurable functions on $\mathbb{R}^n$
 - Hardy-Littlewood maximal functions of $L_{\text{loc}}^1(\mathbb{R}^n)$
 - Lebesgue averaging and differentiation
 - Integrals of a monotonically converging sequence of functions
 - Lebesgue integral from measure of undergraph
 - $L^{p,q}$
 - $E([0, 1]) = E(0, 1), E([-\pi, \pi]) = E(S^1)$
- Lebesgue measure of boundary of open sets in $\mathbb{R}^n$
- Local $\mathbb{R}$ -algebras
- $l^p(\mathbb{R})$
- mapping
 - Image of balls under differentiable maps
 - Inverse of differentiable maps
 - Mean value property of functions
 - Taylor's theorem
 - Operator norm of linear maps between $\mathbb{R}^n$
 - Sequence of functions on $\mathbb{R}^d$
- Metric density of subsets of $\mathbb{R}^n$
- Monotone functions on $\mathbb{R}$
 - Asymptotics of monotonically increasing functions $[0, \infty] \rightarrow [0, \infty]$
- Cauchy integral of periodic functions
- Polygons with integer vertices
- quasiconformal
 - Quasiconformal maps on $\mathbb{C}$
 - Quasiconformal maps on S^n
- Open smooth maps $U \subseteq \mathbb{R}^2 \rightarrow \mathbb{C}$
- Discrete subgroups of $\mathbb{R}^n$
 - Power series sum of a discrete subgroup of $\mathbb{R}^2$
- Discrete cocompact subgroups of $\mathbb{R}^n$, flat tori
- R1
 - Types of discontinuities of functions on $\mathbb{R}$
 - Extremum of functions $\mathbb{R} \rightarrow \mathbb{R}$
 - Fixed points of functions $U \subseteq \mathbb{R} \rightarrow U$
 - $\lim_{x \rightarrow a} \frac{f(x)}{g(x)}$ of functions $f, g : U \subseteq \mathbb{R} \rightarrow \mathbb{R}$
 - Total variation and sequence of continuous functions
- Ramified germs of smooth and holomorphic functions
 - Simple singularities of holomorphic functions
- Open subsets of $\mathbb{R}^n$

- Open subsets of $\mathbb{R}^n$ equipped with the flat metric
- Closed subsets of $\mathbb{R}^n$ equipped with smooth functions
- Quasi-analytic smooth functions on $\mathbb{R}$
- Star-shaped subsets of $\mathbb{R}^n$
- ODEs in $\mathbb{R}^n \leftrightarrow$ Vector fields in $\mathbb{R}^n$
 - Constant of a flow in $\mathbb{R}^n$
 - Euler's iterative solution method for first order ODEs
 - Existence of integral curves of vector fields in $\mathbb{R}^n$
 - Fixed points
 - Flow of a vector field in $\mathbb{R}^n$
 - Graph $\rightarrow$ polynomial ODE
 - Gradient flows on $\mathbb{R}^n$
 - Hamiltonian vector fields in $\mathbb{R}^{2n}$ with standard symplectic form
 - Probability distribution of flow
 - Volume change by flows on $\mathbb{R}^n$
- Convex sets in $\mathbb{R}^n$, $\mathbb{R}\mathbf{H}^n$ or S^n
 - Polyhedron gluings
 - κ -simplicial complex
- Objects stemming from $\mathbb{R}$ -semi-simple/reductive Lie groups
 - subg discr
 - Rigidity of discrete subgroups of simple Lie groups of rank ≥ 2
- set
 - Simplicial sets
- SL $\mathbb{C}$ 2
 - rep
 - FinVec $_{\mathbb{C}}$ irreducible representations of $\mathfrak{sl}(2, \mathbb{C})$
 - $2 \otimes 3 = 5 \oplus 3 \oplus 1$ for FinVec $_{\mathbb{C}}$ irreps of $\mathfrak{sl}(2, \mathbb{C})$
 - $\mathbf{Sym}^2 \mathbf{Sym}^2(\mathbb{C}^2) \cong_{SL_{\mathbb{C}}(2)} \mathbf{Sym}^0(\mathbb{C}^2) \oplus \mathbf{Sym}^4(\mathbb{C}^2)$
- Objects stemming from $PSL(2)(\mathbb{C})$
 - Kleinian groups $\Gamma <_{\mathfrak{d}} PSL(2)(\mathbb{C}) \leftrightarrow$ Hyperbolic 3-manifolds/orbifolds $\Gamma \backslash \mathbb{R}\mathbf{H}^3$
 - Finitely generated, free Kleinian groups
 - 2-generated Kleinian groups
 - Finitely generated Kleinian groups $\leftrightarrow$ topologically tame oriented hyperbolic 3-manifolds/finite degree orbifold covers of
 - Finiteness of finitely generated Kleinian groups
 - Building hyperbolic 3-manifolds by gluing polyhedra
 - Kleinian group with $\Lambda(\Gamma) \neq \partial \mathbb{R}\mathbf{H}^3$
 - Thick-thin decomposition of hyperbolic 3-manifolds
 - Kleinian ultra-Schottky groups $\leftrightarrow$ convex cocompact hyperbolic interior of 3-handlebodies
 - Space of Schottky groups
 - Rep($F_2, PSL(2)(\mathbb{C})$)
- SL $\mathbb{C}$ n
 - Subgroups of $SL(n, \mathbb{C})$ that are semi-simple
- SL $\mathbb{R}$ 2
 - HomGrp($F_2, SL(2)(\mathbb{R})$)
- Objects stemming from $PSL(2)(\mathbb{R})$
 - HomGrp($F_2, PSL(2)(\mathbb{R})$)
 - 2-generated subgroups of $PSL(2)(\mathbb{R})$
 - Fuchsian groups $\Gamma <_{\mathfrak{d}} PSL(2)(\mathbb{R}) \leftrightarrow$ oriented hyperbolic 2-manifold/orbifolds $\rightarrow$ Riemann surfaces with branching signature
 - Artihmetic Fuchsian groups and Artihmetic hyperbolic 2-orbifolds
 - Cocompact Fuchsian groups
 - Heat flow of a cocompact Fuchsian group
 - Central simple algebra
 - Elementary Fuchsian groups
 - Finitely generated Fuchsian groups $\leftrightarrow$ geometrically finite Fuchsian groups
 - Fuchsian groups of finite coarea
 - Geodesic flow of Fuchsian groups and hyperbolic surfaces
 - Decomposition of hyperbolic surfaces
 - Infinitely generated Fuchsian groups
 - Limit set of Fuchsian groups
 - Marked hyperbolic surfaces
 - subst.R PSL 2 discrete subg.over $\mathbb{Q}$ -bar
 - Fuchsian Schottky groups
 - Spectrum of hyperbolic surfaces
 - Torsion-free Fuchsian groups
 - Cocompact torsion-free Fuchsian groups
 - Fuchsian triangle groups
- SU2C
 - HomGrp($\Gamma, SU(2, \mathbb{C})$) / $SU(2, \mathbb{C})$

And it has 0 siblings.