Spacetime: 4+4 = 8 and 6+4 = 10

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This paper is a brief summary of some useful facts about Spacetime for E8 Physics.

In E8 Physics (viXra 1602.0319) at high energies Spacetime is the 8-dimensional
Shilov Boundary RP1 x S7 of the Type IV8 Bounded Complex Domain of
the Symmetric Space Spin(10) / Spin(8)xU(1).

From this point of view, 8-dim Spacetime RP1 x S7 Shilov Boundary
which is acted upon by Spin(1,7)
is the Boundary of a Complex Bulk Space that is a Complex Domain of Type IV8
which Complex Bulk Space has 16 Real dimensions with Clifford Algebra Cl(16).
By 8-Periodicity, Cl(16) = tensor product Cl(8) x Cl(8).
Cl(8) has 8 Vectors, 28 BiVectors, and 16 Spiinors with 8+28+16 = 52 = F4 Lie Algebra.
Cl(16) has 120 BiVectors, and 128 Half-Spiinors with 120+128 = 248 = E8 Lie Algebra.

The Spin(1,7) action on 8-dim Spacetime is the BiVector Lie Algebra of Cl(1,7) which is
a Real Clifford Algebra and Cl(1,7) = Cl(0,8) = Cl(4,4) = M(R,16) = Real 16x16 Matrix Algebra.

At lower energies the 8-dim Octonionic structure of the Shilov Boundary transitions
to Quaternionic Structure of Cl(2,6) = Cl(3,5) = M(H,8) = Quaternion 8x8 Matrix Algebra.

resulting in (4+4)-dim Quaternionic Kaluza-Klein structure M4 x CP2
where CP2 = SU(3) / SU(2)xU(1) is Internal Symmetry Space
and M4 is physical Minkowski Spacetime of Cl(1,3) = M(H,2) ,

Quaternionic Cl(3,5) contains Cl(2,4) = M(H,4) whose BiVector Lie Algebra is
the Conformal Group Spin(2,4) = SU(2,2) that has effective action on M4.
so that
the 4-dim M4 part of (4+4)-dim Kaluza-Klein M4 x CP2 can be represented
as the 6-dim space Cnf6 which is the Vector space of Cl(2,4) with BiVector Spin(2,4)
thus producing
a Conformal (6+4)-dim Spacetime with Kaluza-Klein structure Cnf6 x CP2 .

There is a corresponding Conformal Octonionic 10-dim Spacetime
that is manifested in E8 Physics seen as a 26D String Theory with
Strings being physically interpreted as World-Lines and the spin-2 entities being
seen as carriers of the Bohm Quantum Potential with Sarfatti Back-Reaction.

From this point of view, 10-dim Spacetime is the Boundary of a Complex Bulk Space
Domain of Type IV10 of the Symmetric Space Spin(12) / Spin(10)xU(1)
whose Shilov Boundary is RP1 x S9 on which Spin(1,9) = SL(2,O) acts.

The Spin(1,9) action on 8-dim Spacetime is the BiVector Lie Algebra of Cl(1,9) which is
a Real Clifford Algebra and Cl(1,9) = Cl(2,8) = Cl(5,5) = M(R,32) = Real 32x32 Matrix Algebra.
Cl(1,9) = Cl(2,8) = Cl(5,5) is Conformal over Cl(1,7) = Cl(0,8) = Cl(4,4).

Transition from Octonionic high-energy to Quaternionic low-energy gives
Cl(1,9) = Cl(2,8) = Cl(5,5) = M(R,32) transition to Cl(3,7) = Cl(4,6) = Cl(0,10) = M(H,16).

Tensor Product Cl(0,8) x Cl(p,q) =

= M(R,16) x Cl(p,q) = Cl(p,q+8)

Real Clifford Algebras

Cl(p,q)

H = Quaternion

C = Complex

R = Real

p ↑ \ q -->	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
8	$M_{16}(\mathbf{R})$	$M_{16}(\mathbf{C})$	$M_{16}(\mathbf{H})$	$M_{16}(\mathbf{H}) \oplus M_{16}(\mathbf{H})$	$M_{32}(\mathbf{H})$	$M_{64}(\mathbf{C})$	$M_{128}(\mathbf{R})$	$M_{128}(\mathbf{R}) \oplus M_{128}(\mathbf{R})$	$M_{256}(\mathbf{R})$								
7	$M_8(\mathbf{C})$	$M_8(\mathbf{H})$	$M_8(\mathbf{H}) \oplus M_8(\mathbf{H})$	$M_{16}(\mathbf{H})$	$M_{32}(\mathbf{C})$	$M_{64}(\mathbf{R})$	$M_{64}(\mathbf{R}) \oplus M_{64}(\mathbf{R})$	$M_{128}(\mathbf{R})$	$M_{128}(\mathbf{C})$	$M_{128}(\mathbf{H})$							
6	$M_4(\mathbf{H})$	$M_4(\mathbf{H}) \oplus M_4(\mathbf{H})$	$M_8(\mathbf{H})$	$M_{16}(\mathbf{C})$	$M_{32}(\mathbf{R})$	$M_{32}(\mathbf{R}) \oplus M_{32}(\mathbf{R})$	$M_{64}(\mathbf{R})$	$M_{64}(\mathbf{C})$	$M_{64}(\mathbf{H})$	$M_{64}(\mathbf{H}) \oplus M_{64}(\mathbf{H})$	$M_{128}(\mathbf{H})$						
5	$M_2(\mathbf{H}) \oplus M_2(\mathbf{H})$	$M_4(\mathbf{H})$	$M_8(\mathbf{C})$	$M_{16}(\mathbf{R})$	$M_{16}(\mathbf{R}) \oplus M_{16}(\mathbf{R})$	$M_{32}(\mathbf{R})$	$M_{32}(\mathbf{C})$	$M_{32}(\mathbf{H})$	$M_{32}(\mathbf{H}) \oplus M_{32}(\mathbf{H})$	$M_{64}(\mathbf{H})$	$M_{128}(\mathbf{C})$	$M_{256}(\mathbf{R})$					
4	$M_2(\mathbf{H})$	$M_4(\mathbf{C})$	$M_8(\mathbf{R})$	$M_8(\mathbf{R}) \oplus M_8(\mathbf{R})$	$M_{16}(\mathbf{R})$	$M_{16}(\mathbf{C})$	$M_{16}(\mathbf{H})$	$M_{16}(\mathbf{H}) \oplus M_{16}(\mathbf{H})$	$M_{32}(\mathbf{H})$	$M_{64}(\mathbf{C})$	$M_{128}(\mathbf{R})$	$M_{128}(\mathbf{R}) \oplus M_{128}(\mathbf{R})$	$M_{256}(\mathbf{R})$				
3	$M_2(\mathbf{C})$	$M_4(\mathbf{R})$	$M_4(\mathbf{R}) \oplus M_4(\mathbf{R})$	$M_8(\mathbf{R})$	$M_8(\mathbf{C})$	$M_8(\mathbf{H})$	$M_8(\mathbf{H}) \oplus M_8(\mathbf{H})$	$M_{16}(\mathbf{H})$	$M_{32}(\mathbf{C})$	$M_{64}(\mathbf{R})$	$M_{64}(\mathbf{R}) \oplus M_{64}(\mathbf{R})$	$M_{128}(\mathbf{R})$	$M_{128}(\mathbf{C})$	$M_{128}(\mathbf{H})$			
2	$M_2(\mathbf{R})$	$M_2(\mathbf{R}) \oplus M_2(\mathbf{R})$	$M_4(\mathbf{R})$	$M_4(\mathbf{C})$	$M_4(\mathbf{H})$	$M_4(\mathbf{H}) \oplus M_4(\mathbf{H})$	$M_8(\mathbf{H})$	$M_{16}(\mathbf{C})$	$M_{32}(\mathbf{R})$	$M_{32}(\mathbf{R}) \oplus M_{32}(\mathbf{R})$	$M_{64}(\mathbf{R})$	$M_{64}(\mathbf{C})$	$M_{64}(\mathbf{H})$	$M_{64}(\mathbf{H}) \oplus M_{64}(\mathbf{H})$	$M_{128}(\mathbf{H})$		
1	$\mathbf{R} \oplus \mathbf{R}$	$M_2(\mathbf{R})$	$M_2(\mathbf{C})$	$M_2(\mathbf{H})$	$M_2(\mathbf{H}) \oplus M_2(\mathbf{H})$	$M_4(\mathbf{H})$	$M_8(\mathbf{C})$	$M_{16}(\mathbf{R})$	$M_{16}(\mathbf{R}) \oplus M_{16}(\mathbf{R})$	$M_{32}(\mathbf{R})$	$M_{32}(\mathbf{C})$	$M_{32}(\mathbf{H})$	$M_{32}(\mathbf{H}) \oplus M_{32}(\mathbf{H})$	$M_{64}(\mathbf{H})$	$M_{128}(\mathbf{C})$	$M_{256}(\mathbf{R})$	
0	$\mathbf{R}$	$\mathbf{C}$	$\mathbf{H}$	$\mathbf{H} \oplus \mathbf{H}$	$M_2(\mathbf{H})$	$M_4(\mathbf{C})$	$M_8(\mathbf{R})$	$M_8(\mathbf{R}) \oplus M_8(\mathbf{R})$	$M_{16}(\mathbf{R})$	$M_{16}(\mathbf{C})$	$M_{16}(\mathbf{H})$	$M_{16}(\mathbf{H}) \oplus M_{16}(\mathbf{H})$	$M_{32}(\mathbf{H})$	$M_{64}(\mathbf{C})$	$M_{128}(\mathbf{R})$	$M_{128}(\mathbf{R}) \oplus M_{128}(\mathbf{R})$	$M_{256}(\mathbf{R})$