	P262 LEC 5: FIETS of 8U(3) 23 JAN 19
The second secon	MEVIEW: Generators of SU(3)
	RAISING \$ CARTAN LOWERING SUBALGEBRA
	$Q: HOW MANY?$ $Q: if H_1, H_2 \in CAPTAN$ 3. WE CAUED What is $LH_1, H_2J:?$ THEM $T^{\pm}, V^{\pm}, U^{\pm}$ \rightarrow 0
	Q: How MANY for su(4)? Q. what is generic 6. form of [H, T=]?
this bas	Can be negative Can be negative encodes "geomety" T*, u*, v* 3 ADDITIONAL (really trigonametry
	T±, u±, v± 3 ADDITIONAL (really trigonometry Q. HOW MANY EVERNENTS
The state of the s	IN CARTAN OF SU(N)? N-1)
The second secon	diagonal traceless Hermitian N×N
	· diag + Hermitian: IR entries on diag . traceless: one constraint on 14 diag elem.
To any other particular and the second secon	

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	2	o.	? 3U(2):	1M-1>	T.	[W+1>
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what you can do: Using [:.] relations, write $d(T^a)$ as a 3x3 matrix finite ROTATION: $D(g(\theta)) = \exp(-i\theta d(T))$

the off diag elem of d(T) == un comb of RAISING/ comeRING

	(back to surs))
	3 RAISING/WERING -> "but" only 2 contain elements
	# of cartan elements tells you about the indices of states
	do not confuse 1 p. 8> w/ indices of "1
	vector in rep. if you want, you can call these
	20 antim #'s (nothing to
some dimensio	A REP. of SU(3): IP. 81 > FOR A SET OF STATES IR. 82 > Indexed by (P2.82)
	S.t. b = a P. B. > + b P2, B2 > +

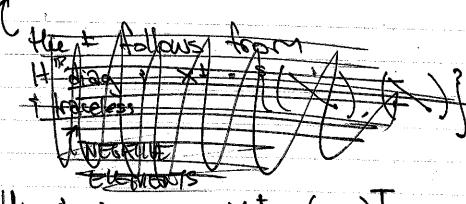
Andrews and the same

so now the problem is: how do we find the set of (Pi, &i) for a given representation? in su(z): T-IM:>= Nm. IM-1> na poisu conventions T+ |m-1> = Nm |m ;> (3)08 (1) Apg s.t. <m/m> = 1 ⇒ Nm = N(j-m+1)(j+m) we picked i to be highest weight T+11)> =0 & which we can see in Nm: (j+1-(j+1)=0 when m-1=j (cf 7+1m> egn above) WE ALSO SEE THAT [M = - 1] is lowest WEIGHT. 2 (j+m)=0 when m=-5 TO DEGREASES on By one unit. so the DISTANCE BOWN MANS: 1 7 MMM = - J MUST BE A COUNTING #: N = M max - W min

and the control of th	APPLY THIS TO SU(3):
The state of the s	I no additional work!
т Матенафурда, аутратынун түзүнүн үчүнүнү түндүү түй	
	The raising ? lowering pairs T, V, U all look like copies of su(2)
	all look like and I will
	"" ("E cop)es of SU(2)
en Samuragajan era era amanan agenad benerjar (personen amanan akas eksamere	Lie concert: 11 xt1
ما المراجعة والمراجعة المراجعة	in general: let X = be a raising/lowering
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	the cartan
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the same of the sa	can be Any elements
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Oliman Millionia september and desirence and an array array and array array and array	drose explicitly)
	I subject to MORMALIZATION
у даудаган тарааган көлөп (долу доругуу у мендий манулдаган анулдаг	in "defining rep" - Tr (H2) = =
Comment	(really just from face)
CALCANSA	The state of the s
1998 bili sama di sama di sama di manananan di samaya manaya di manaya di samaya di samaya di samaya di samaya	In fact: there is something like
······································	not a metric in a the MGEDRA:
100	POSHVE del. R(T9, T6) = Tr 24(T9) 24(T6)]
1 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 -	The second secon
The second secon	Huis is subtle. see eq.
en de la companya de	cano ch.III
and the second s	Gutowski & 2.17
ik di dan di p. p.	THIS OF THE PROPERTY OF THE PR

$$[x^{+}, x^{-}] = c_{1}H_{1} + c_{2}H_{2}$$

 $[H_{1}, x^{\pm}] = \pm a_{1}x^{\pm}$
 $[H_{2}, x^{\pm}] = \pm a_{2}x^{\pm}$



the \pm is easy: $X^{\dagger} = (X^{-})^{T}$ and H is diagonal: $H^{T} = H$

 $[H, X^{+}] = C$ $HX^{+} - X^{+}H = C$ $W^{+}, W^{+} = C$ $(X^{+})^{T}H^{T} - H^{T}(X^{+})^{T} = C^{T}$

-[H7, X-] = CT [H, X-] = -CT

 $C = X^-$ when $C = X^+$

FACT: $C_1 = 2Q_1$ 3 whom form of X^{\pm} $C_2 = 2Q_2$ 3 (Goes fact to our SU(2) conventions)

EXTRA OPENIT! PROVE THIS (JAMOBI 10 SHOULD NO IT)

	these commutation relations hold for
	EACH PAIR OF RAISE/LOWER OPS
A	
d at Marie is a resourced and also than foresteen the special first purp and extreme to be applied to the	in other words: for saper paise/con:
· Manh	$[X^{+}, X^{-}] = 2X^{3} \leftarrow X^{3} = a_{1}H_{1} + a_{2}H_{2}$ $[X^{3}, X^{\pm}] = \pm X^{\pm}$ (M CNETAN)
	1 X3, X ± 1 = ± X ±
and the company of the particular game, the constraint of the community day has	
	so for EARH raise/lower
	there is some quantum number mx
a state of the sta	AS AN EVEZ)
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fuis is	SUCH THAT: I hoighost weight ix
our flucti	x = are raising/lowerna
	Such THAT: I haighost weight jx xt are raising/lowerney lowest weight is jx
Charles a sample of the same o	
- PE-10-2" OR TOTAL - AMERICAN SECTION	$And \int x = \frac{n^2}{2}$
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in and a standard supple supple resemble of the supple sup	L counting # 1/x
Advances and the control of the cont	
off and a few activities and a second and a	THIS IS WHY SU(2) IS THE "BASK MODULE"
bi dell'est (f. f. f	of he algebras.
	Miles is the construction of the second construction of the constr

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80 NOW WE KNOW A LOT ABOUT BACH
RAISING/LOWERING SEPARATELY.
PUTTING IT TOGETHER: only 2 indep. CARTANI HOM
PUTTING IT TOGETHER: only 2 indep. CARTAN BURN. -> really only 2 indices (p, g) for states
2 2 de 2 de 2
BUT 3 quartum numbers: MT, MV, MD
these are related by the one fficients
(a, , 98) = m turn, fixed by
M 70(9) TIXED BY
MORMANIZATION of H., H?
THE CO BACK TO INC.
LET'S GO BACK TO OUR ISYPUCHT T'V, UZ
BASIS TO BE CLEAR:
\mathcal{L}^{α}
$M_{\tau} = P$ α_{z}
$M_{V} = \frac{1}{2}P + \frac{13}{2}g$
mu =-= P + 13 g < not modep.
HEIGHEST WEIGHT
Zj is a construg of (from su(2))
\Rightarrow $z p_{max} = n_T$
=> PMAX + NB & CNAX = ON 3 2NB & MAX 15 COUNTY NG
=> PMx + N3 gmax = 00 } 2N3 gmax is #
(lerror m vec 4))
And the second of the second o

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FUNDAMENTAL: "3 of
$$8V(3)$$
"

PICK (P.8) max = $(\frac{1}{2}, \frac{1}{2\sqrt{3}})$

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(-12, $\frac{1}{2\sqrt{3}}$)

(-12, $\frac{1}{2\sqrt{3}}$)

(-13, $\frac{1}{2\sqrt{3}}$)

(-14, $\frac{1}{2\sqrt{3}}$)

(-15, $\frac{1}{2\sqrt{3}}$)

(-17, $\frac{1}{2\sqrt{3}}$)

(-18, $\frac{1}{2\sqrt{3}}$)

(-19, $\frac{1}{2\sqrt{3$

	or 3, "three-bar"
	Another PEP: 3, antifundamental
	(P, g) max = (0, 1/3) = 0, 09=2
	(e, 1/3)
	$\left(-\frac{1}{2}, \frac{1}{2\sqrt{3}}\right)$
PMC 1A	12 Chimbo = 1
	Matter p than prinx"
- on p.B	But > it's not pmax. It's (P, E) max!
-	BLSO: Alus 13 JUST (P, 8) +> (-P, -8)
	fear 3!