

## Emergent quasiparticles in Euclidean tiling

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Abstract

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## $k = 2$ LATTICES

### t2001

Tiling reference number t2001 with space-group ' $Amm2'$ ' (38) and 18 sites in the unit cell, with vertex type indicated in Tab. S1. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S1.

TABLE S1. Tiling t2001 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	12	0	6	0	0	0	0	0	0	0	0

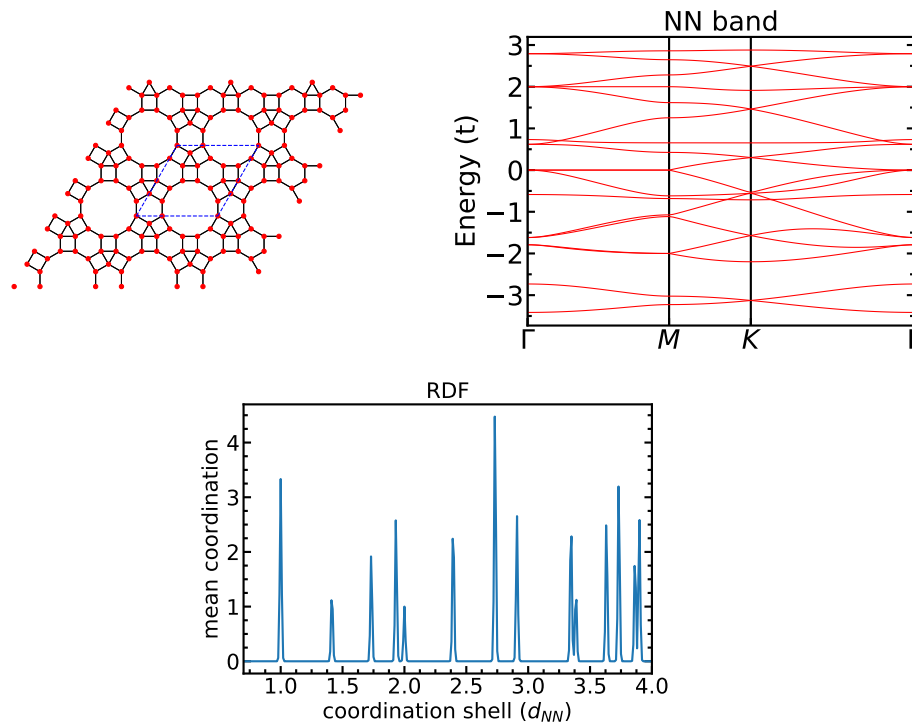


FIG. S1. t2001 lattice framework, nearest neighbors band structure and radial distribution function.

## t2002

Tiling reference number t2002 with space-group ' $Pmm2'$ ' (25) and 8 sites in the unit cell, with vertex type indicated in Tab. S2. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S2.

TABLE S2. Tiling t2002 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	4	0	0	0	0	0	0	0	0	4	0	0

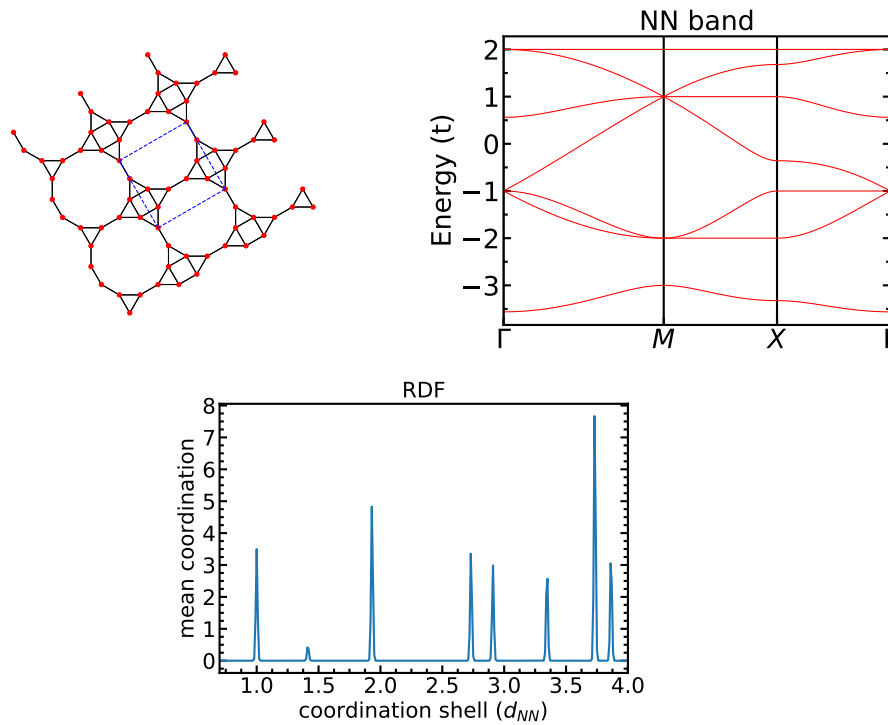


FIG. S2. t2002 lattice framework, nearest neighbors band structure and radial distribution function.

### t2003

Tiling reference number t2003 with space-group ' $Cmmm$ ' (65) and 4 sites in the unit cell, with vertex type indicated in Tab. S3. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S3.

TABLE S3. Tiling t2003 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	2	0	0	0	0	0	0	0	0	2	0	0	0	0

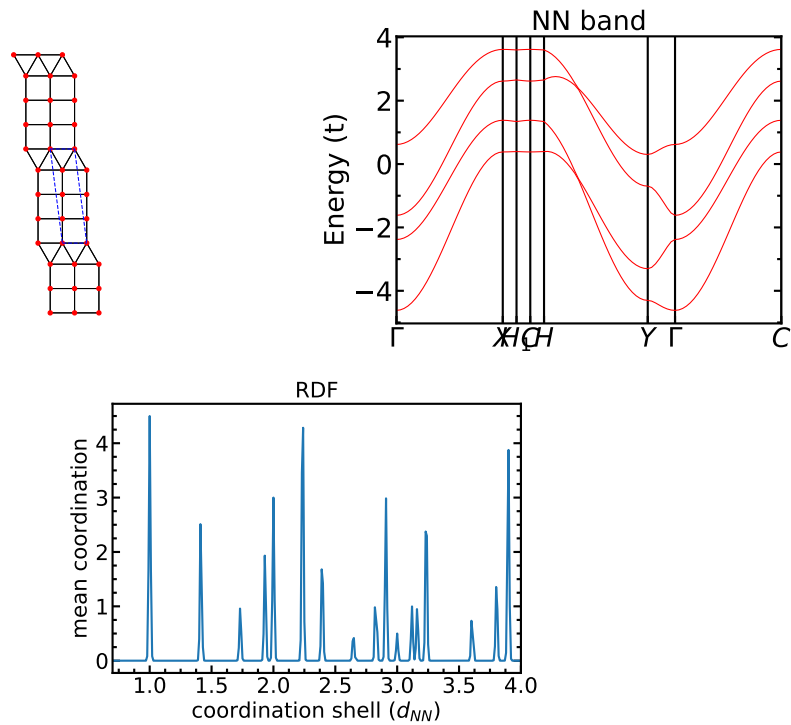


FIG. S3. t2003 lattice framework, nearest neighbors band structure and radial distribution function.

**t2004**

Tiling reference number t2004 with space-group ' $Cmmm$ ' (65) and 3 sites in the unit cell, with vertex type indicated in Tab. S4. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S4.

TABLE S4. Tiling t2004 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	1	0	0	0	0	0	0	0	0	2	0	0	0	0

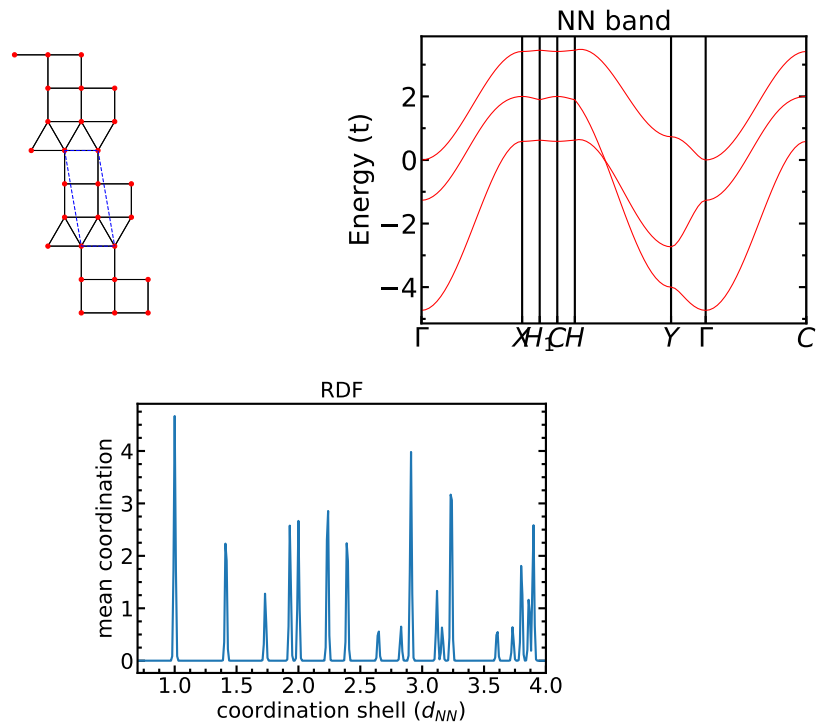


FIG. S4. t2004 lattice framework, nearest neighbors band structure and radial distribution function.

## t2005

Tiling reference number t2005 with space-group ' $Cmmm$ ' (65) and 18 sites in the unit cell, with vertex type indicated in Tab. S5. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S5.

TABLE S5. Tiling t2005 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	6	0	0	0	0	0	0	12	0

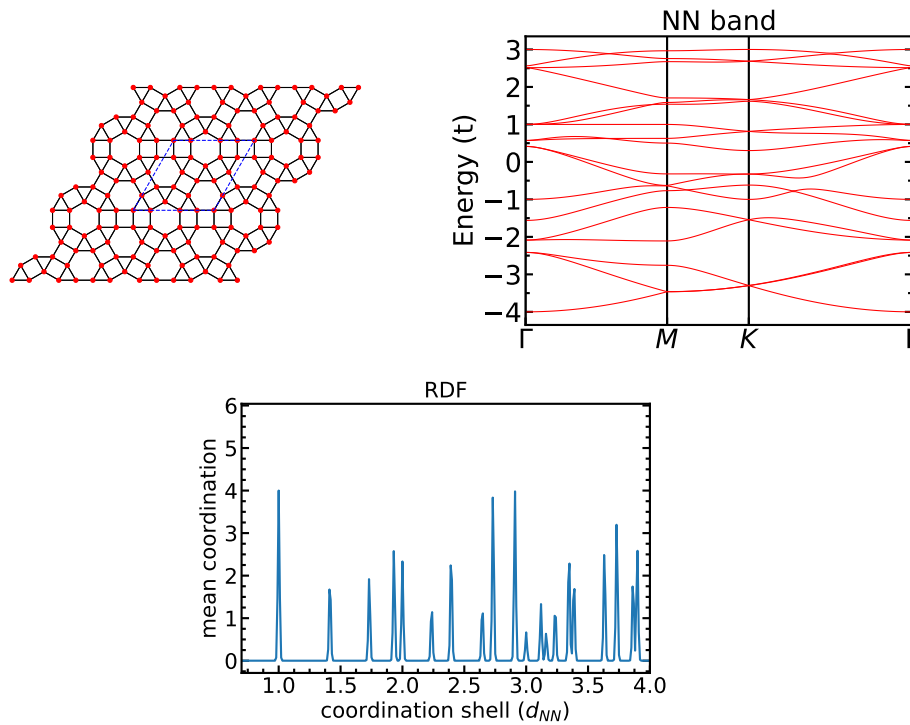


FIG. S5. t2005 lattice framework, nearest neighbors band structure and radial distribution function.

**t2006**

Tiling reference number t2006 with space-group ' $Cmmm$ ' (65) and 5 sites in the unit cell, with vertex type indicated in Tab. S6. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S6.

TABLE S6. Tiling t2006 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	1	0	0	0	0	0	4	0

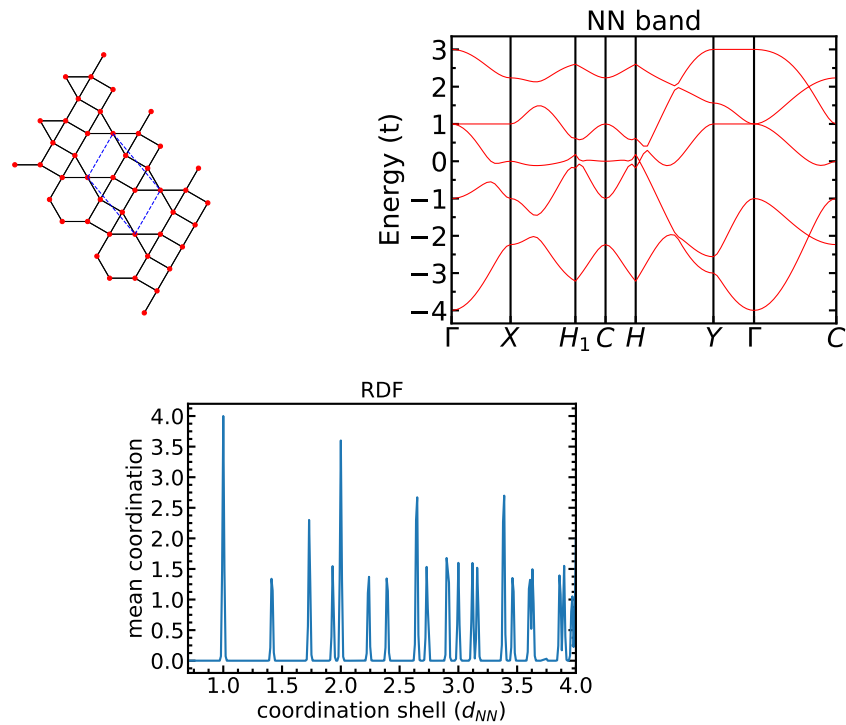


FIG. S6. t2006 lattice framework, nearest neighbors band structure and radial distribution function.

## t2007

Tiling reference number t2007 with space-group ' $Pmmm'$ ' (47) and 5 sites in the unit cell, with vertex type indicated in Tab. S7. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S7.

TABLE S7. Tiling t2007 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	1	0	0	0	0	0	4	0

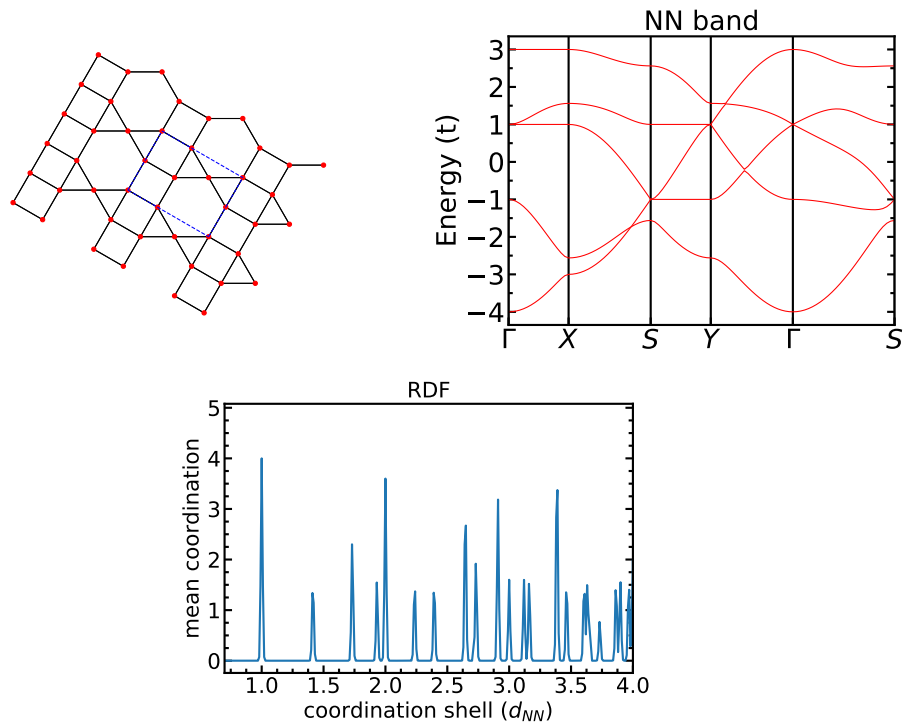


FIG. S7. t2007 lattice framework, nearest neighbors band structure and radial distribution function.



**t2008**

Tiling reference number t2008 with space-group ' $Amm2'$ ' (38) and 12 sites in the unit cell, with vertex type indicated in Tab. S8. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S8.

TABLE S8. Tiling t2008 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	6	0	0	0	6	0	0	0	0

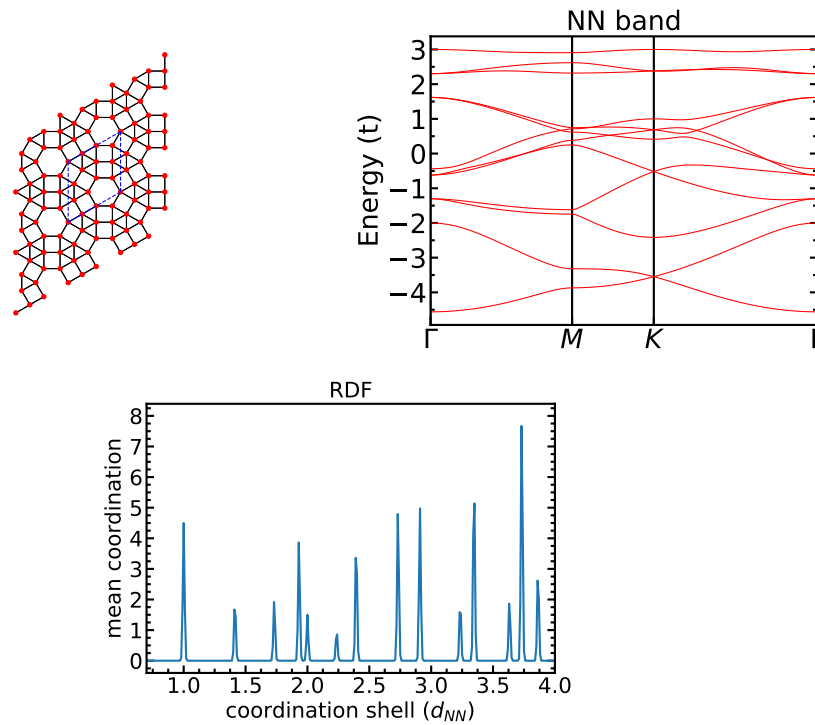


FIG. S8. t2008 lattice framework, nearest neighbors band structure and radial distribution function.

**t2009**

Tiling reference number t2009 with space-group ' $P2/m'$ ' (10) and 12 sites in the unit cell, with vertex type indicated in Tab. S9. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S9.

TABLE S9. Tiling t2009 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	6	0	0	6	0	0	0	0	0

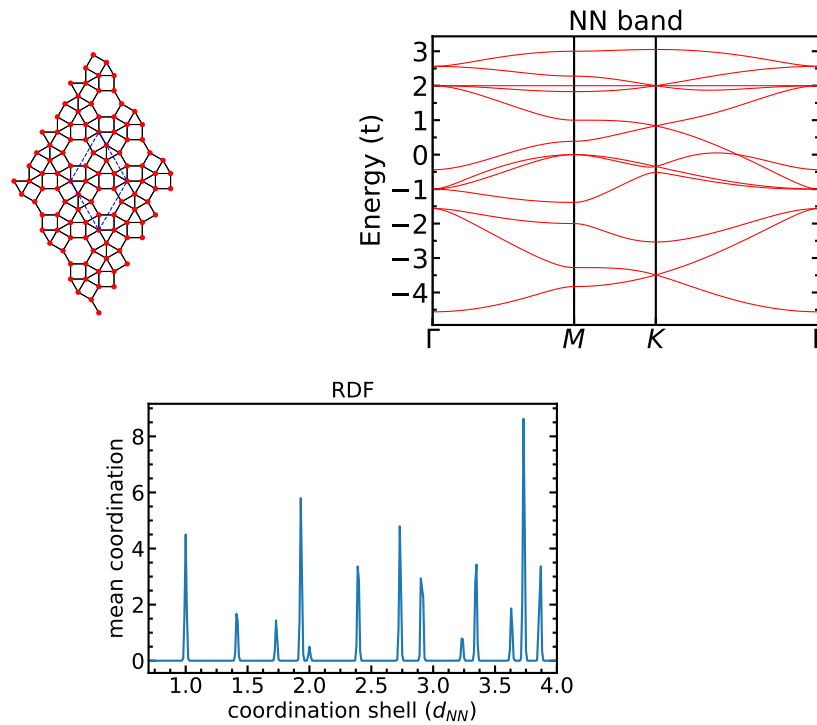


FIG. S9. t2009 lattice framework, nearest neighbors band structure and radial distribution function.

## t2010

Tiling reference number t2010 with space-group ' $P6/mmm'$ ' (191) and 7 sites in the unit cell, with vertex type indicated in Tab. S10. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S10.

TABLE S10. Tiling t2010 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	0	0	0	0	0	0	0	0	0	0	0	0	0	6

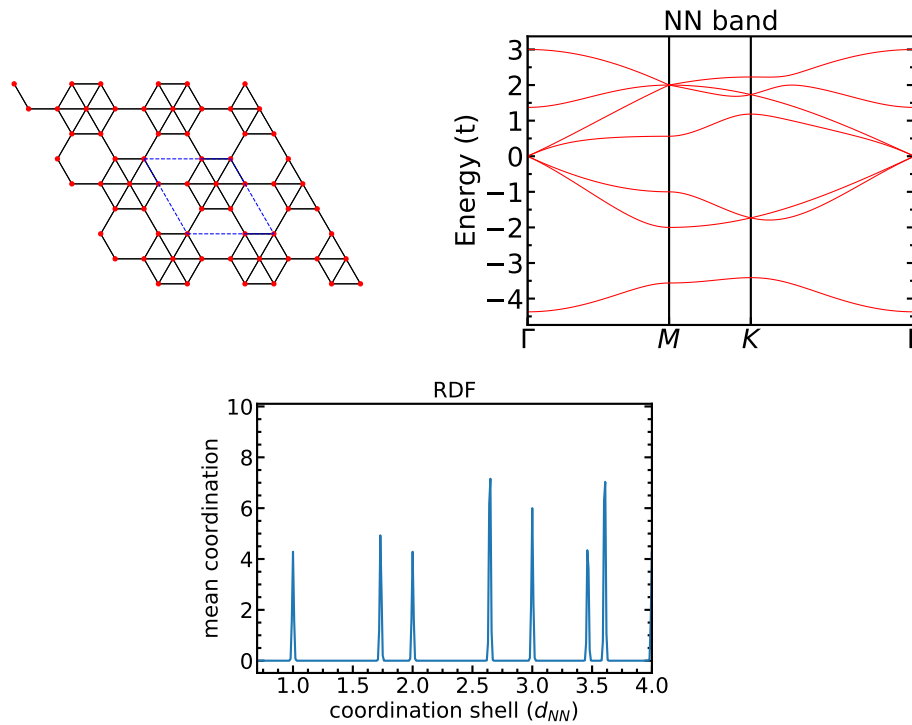


FIG. S10. t2010 lattice framework, nearest neighbors band structure and radial distribution function.

**t2011**

Tiling reference number t2011 with space-group ' $Pmmm'$ ' (47) and 3 sites in the unit cell, with vertex type indicated in Tab. S11. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S11.

TABLE S11. Tiling t2011 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	1	0	0	0	0	0	0	2

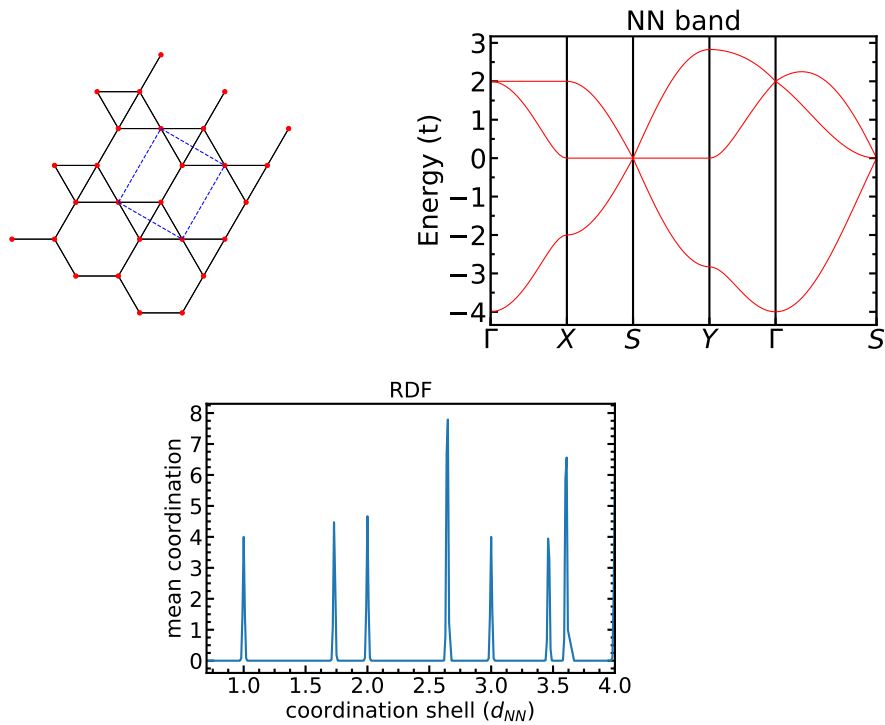


FIG. S11. t2011 lattice framework, nearest neighbors band structure and radial distribution function.

**t2012**

Tiling reference number t2012 with space-group ' $Cmmm$ ' (65) and 4 sites in the unit cell, with vertex type indicated in Tab. S12. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S12.

TABLE S12. Tiling t2012 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	0	2	0	0	0	0	0	2

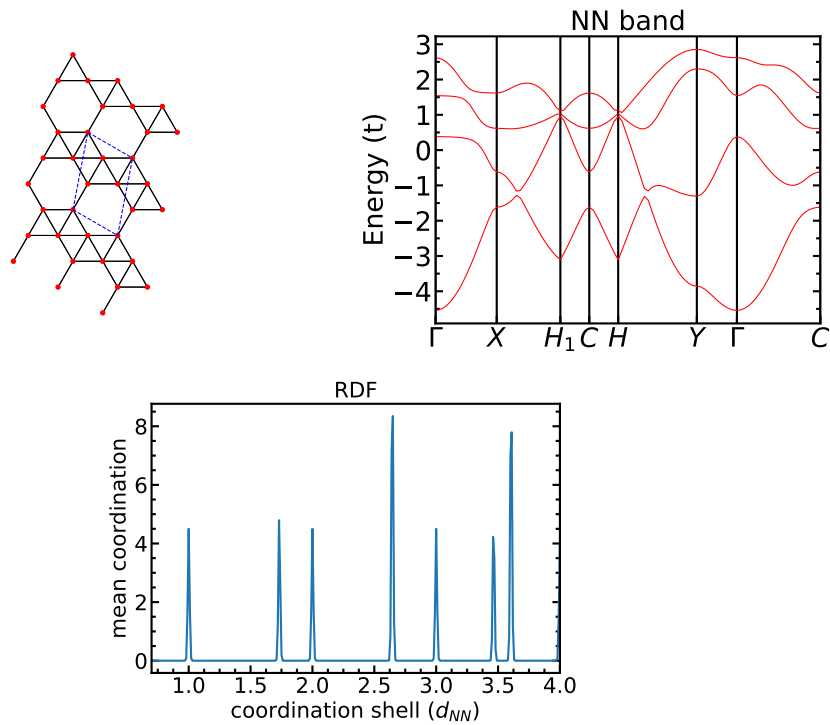


FIG. S12. t2012 lattice framework, nearest neighbors band structure and radial distribution function.

**t2013**

Tiling reference number t2013 with space-group ' $Cmmm$ ' (65) and 14 sites in the unit cell, with vertex type indicated in Tab. S13. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S13.

TABLE S13. Tiling t2013 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
2	0	0	0	0	0	0	0	0	0	0	12	0	0	0

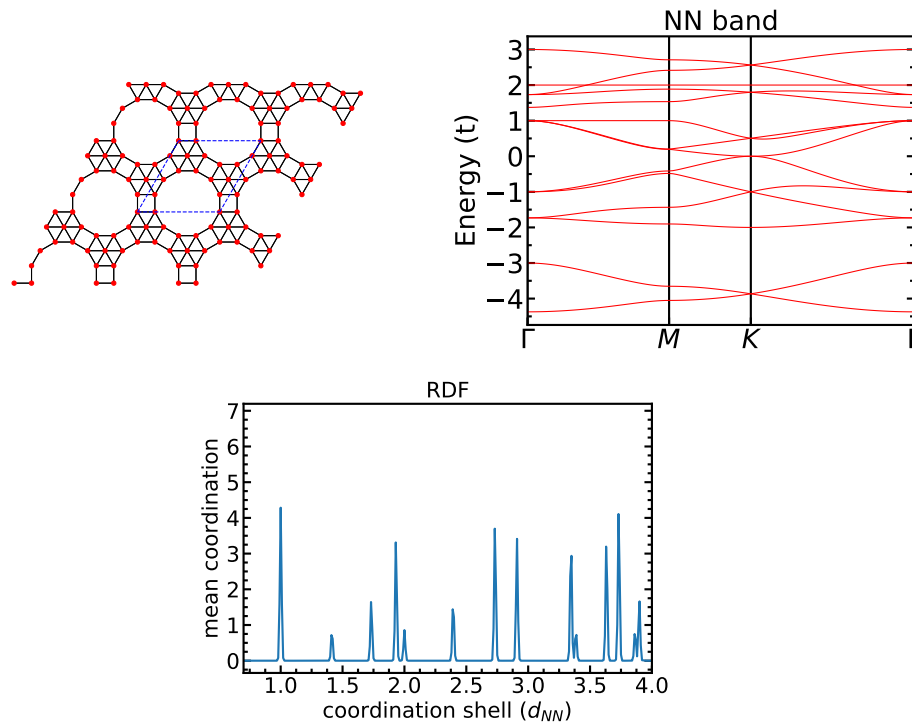


FIG. S13. t2013 lattice framework, nearest neighbors band structure and radial distribution function.

**t2014**

Tiling reference number t2014 with space-group ' $Pmmm'$ ' (47) and 3 sites in the unit cell, with vertex type indicated in Tab. S14. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S14.

TABLE S14. Tiling t2014 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	0	0	0	0	0	0	0	0	0	2	0	0	0	0

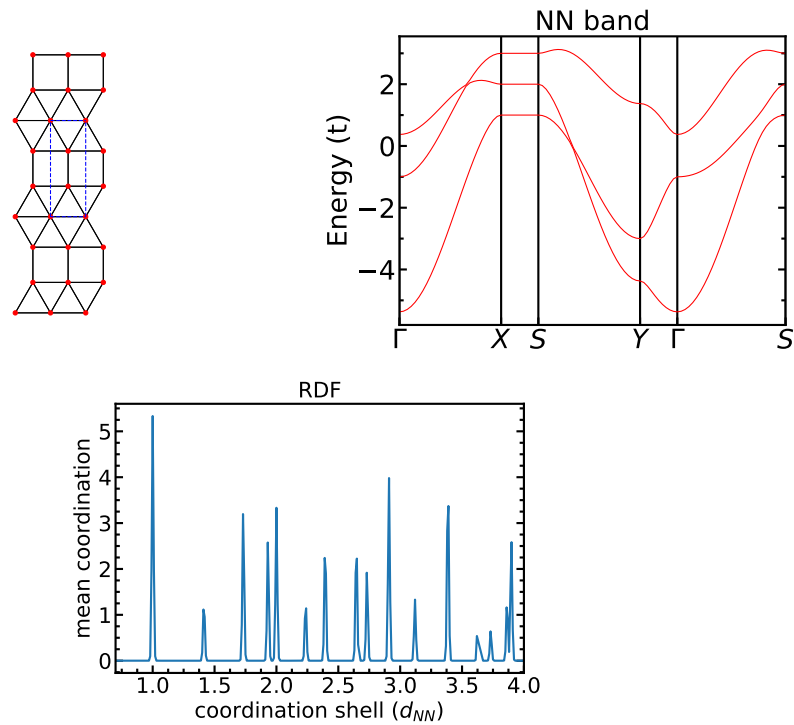


FIG. S14. t2014 lattice framework, nearest neighbors band structure and radial distribution function.

**t2015**

Tiling reference number t2015 with space-group ' $Cmmm$ ' (65) and 4 sites in the unit cell, with vertex type indicated in Tab. S15. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S15.

TABLE S15. Tiling t2015 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
2	0	0	0	0	0	0	0	0	0	2	0	0	0	0

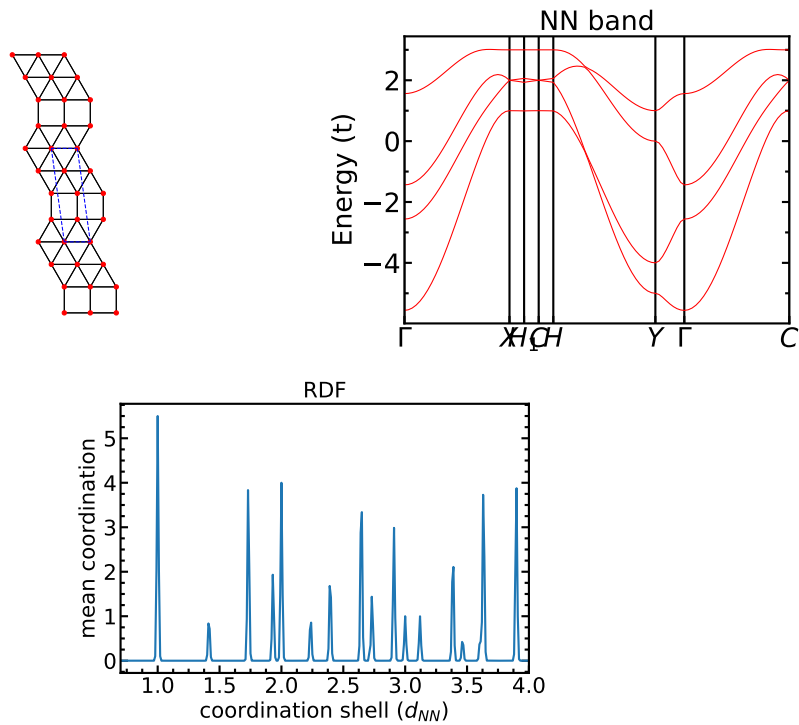


FIG. S15. t2015 lattice framework, nearest neighbors band structure and radial distribution function.



**t2016**

Tiling reference number t2016 with space-group ' $P4/mbm$ ' (127) and 12 sites in the unit cell, with vertex type indicated in Tab. S16. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S16.

TABLE S16. Tiling t2016 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	0	0	8	4	0	0	0	0

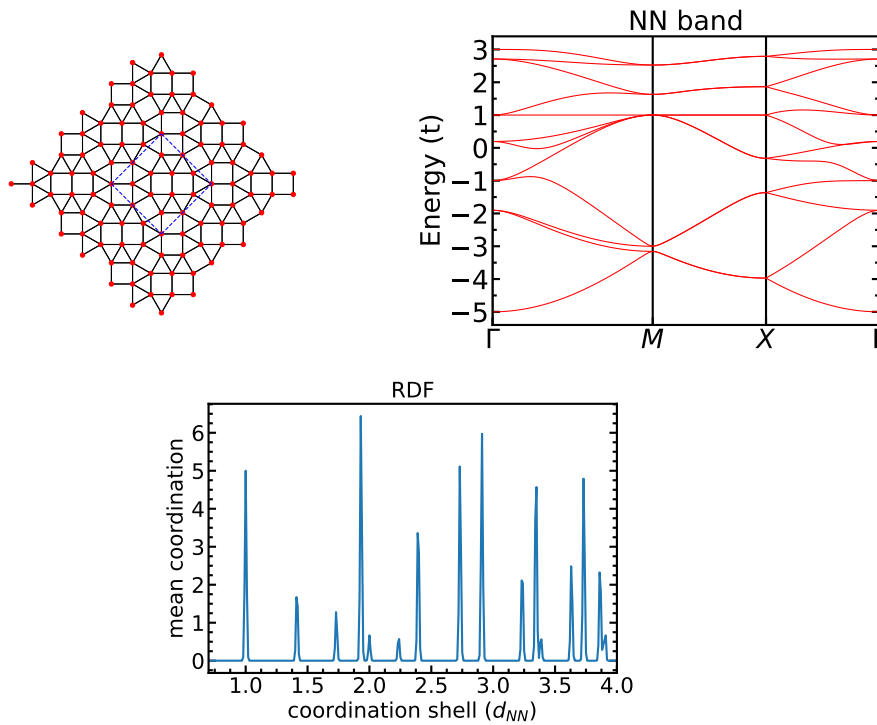


FIG. S16. t2016 lattice framework, nearest neighbors band structure and radial distribution function.

## t2017

Tiling reference number t2017 with space-group ' $Pmc2_1$ ' (26) and 8 sites in the unit cell, with vertex type indicated in Tab. S17. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S17.

TABLE S17. Tiling t2017 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0	0	0	0	0	0	0	0	0	4	4	0	0	0	0

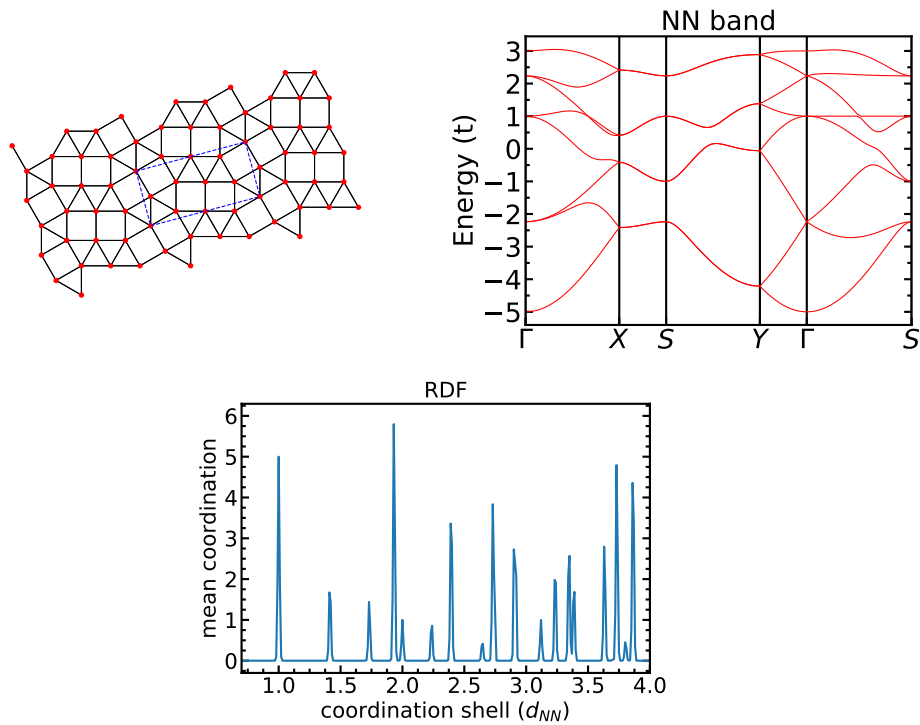


FIG. S17. t2017 lattice framework, nearest neighbors band structure and radial distribution function.

t2018

Tiling reference number t2018 with space-group ' $Amm2'$ ' (38) and 7 sites in the unit cell, with vertex type indicated in Tab. S18. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S18.

TABLE S18. Tiling t2018 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	0	0	0	0	0	0	0	0	6	0	0	0	0	0

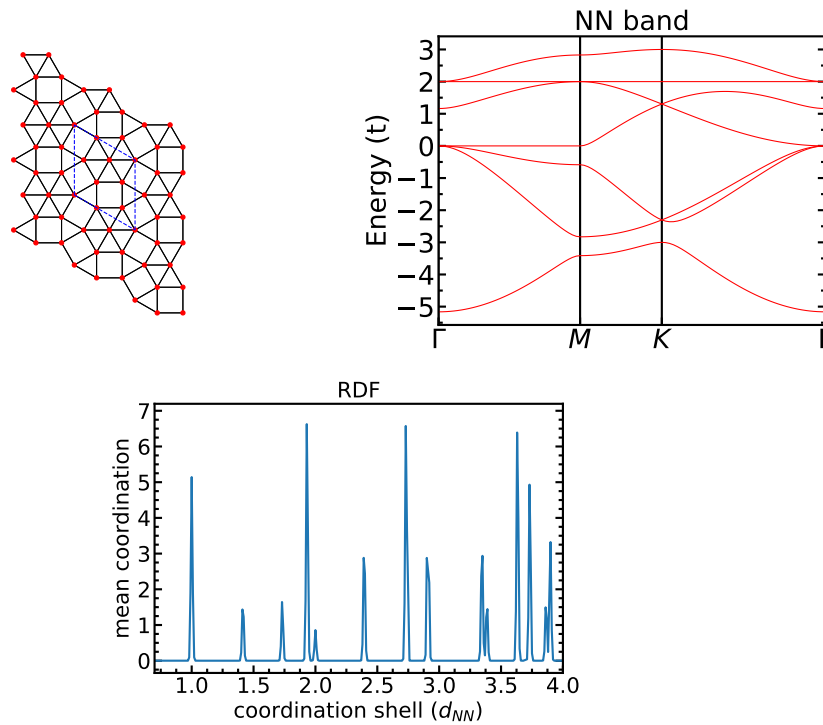


FIG. S18. t2018 lattice framework, nearest neighbors band structure and radial distribution function.

**t2019**

Tiling reference number t2019 with space-group ' $P6/mmm'$ ' (191) and 8 sites in the unit cell, with vertex type indicated in Tab. S19. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S19.

TABLE S19. Tiling t2019 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
2	0	0	0	0	0	0	0	6	0	0	0	0	0	0

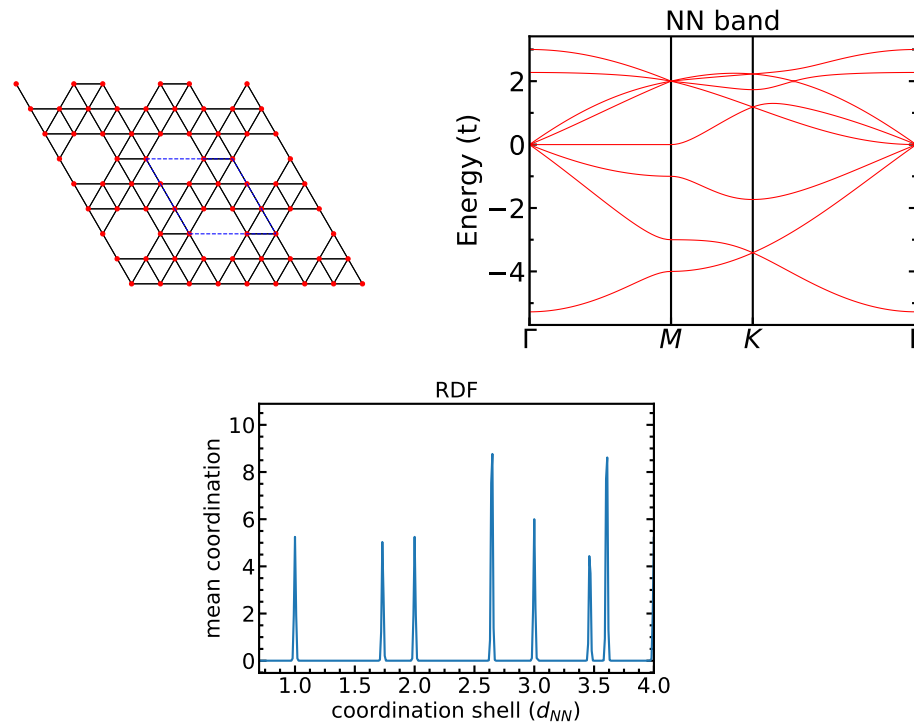


FIG. S19. t2019 lattice framework, nearest neighbors band structure and radial distribution function.

## t2020

Tiling reference number t2020 with space-group ' $P6/m'$ ' (175) and 12 sites in the unit cell, with vertex type indicated in Tab. S20. The respective lattice structure, nearest neighbors band structure, and radial distribution function is shown in Fig S20.

TABLE S20. Tiling t2020 vertex types

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
6	0	0	0	0	0	0	0	6	0	0	0	0	0	0

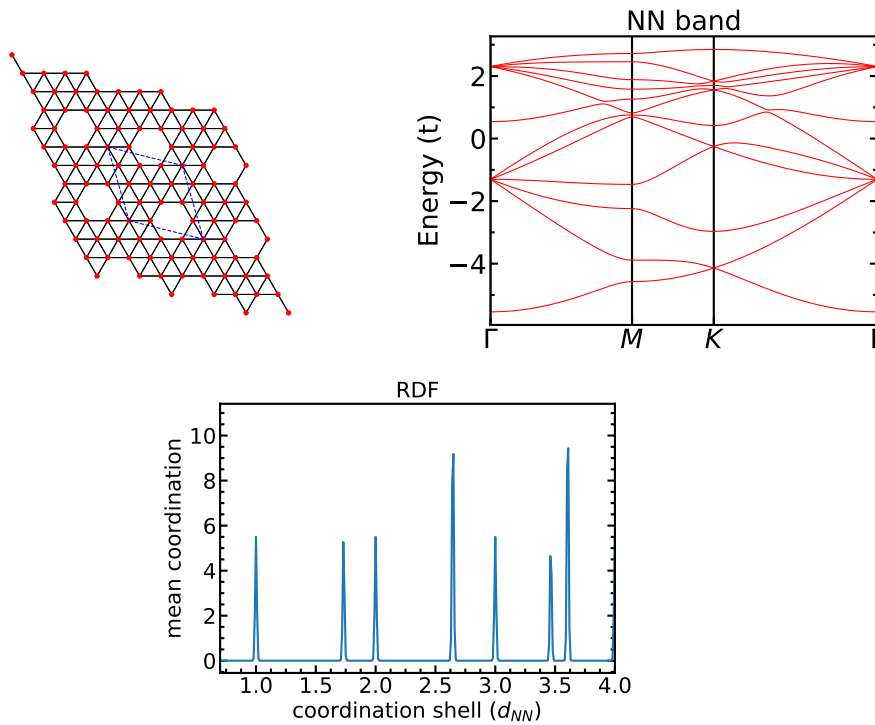


FIG. S20. t2020 lattice framework, nearest neighbors band structure and radial distribution function.

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